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A REVISION OF THE COSMOPTERIGIDAE OF AMERICA NORTH OF MEXICO, WITH A DEFINITION OF THE MOMPHTIDAE AND WALSHIIDAE (LEPIDOPTERA: GELECHIOIDEA)¹

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INTRODUCTION

This study started as a generic review of the Cosmopterigidae (in the sense of the McDunnough, 1939, list) for the purpose of defining the Cosmopterigidae and Momphidae and assigning the North American genera and species to them. Study soon showed that it would be impossible to proceed as planned without first determining the species. This was done for the Cosmopterigidae, but the number of species in this family proved to be so large that it was not feasible to do the same for the Momphidae and Walshiidae (defined later). However, the type species of the genera of the North American and European Momphidae and Walshiidae have been examined, and a study made of the types of the described species of Walshiidae. Three major items form the body of this paper: 1) the definition of the Cosmopterigidae, Momphidae, and Walshiidae, 2) the revision of the Cosmopterigidae, and 3) the grouping of the North American species and genera (and some of

the European genera) under the three families in an annotated list.

The revision of the Cosmopterigidae is at best preliminary, because many species and a few genera undoubtedly remain to be described from the United States. This can be exemplified by the results of an eleven day period of collecting in south-central Florida, where eleven species of cosmopterigids were collected, six of which are new, one of them representing a new genus. However, the keys and illustrations of the moths and of the male and female genitalia should enable a worker to determine whether his specimens have been described.

TERMS

The terminology for the external features of the adults follows Forbes (1923) with the exception of the wings. The numeral system for the venation (Fig. 11) follows Meyrick (1928). I have used "dorsal" margin for what is called the "inner" margin by many lepidopterists. In describing the maculation of the antennae, I have considered that they were held at right angles with the longitudinal axis of the body. The fraction following the antennae in the descriptions is the ratio of the length of the antenna to the length of the forewing. The alar expanse was determined by measuring the distance from the middle of the thorax to the apex of the wing and doubling this figure. Colors used to describe the patterns were as seen under incandescent illumination.

The male genitalia pose problems because the terminology given by Klots (1956) is based mainly upon the higher moths, Geometridae and Noctuidae. The Gelechioidea are a highly evolved group, and many of the structures are doubtfully homologous with those of the same name in other groups. I have attempted to apply the terms given by Klots whenever they seemed reasonable, but one must realize that a thorough morphological study of the genitalia of all of the Microlepidoptera is required before an accurate application of terms can be made. Where a structure seemed not to be homologous with a named one, I have given a descriptive phrase for it rather than coin a new term. Figure 28 illustrates the structures and their terminology. The terminology used for the female genitalia follows Klots and is illustrated in Figure 89.

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SPECIAL TECHNIQUES

A ventral mount of the male genitalia with the valvae spread is desirable for the comparison of a maximum number of features. The genitalia of several of the cosmopterigids are difficult to maneuver into this position because of the relation of parts; however, it is often possible to obtain the desired results by the following procedure: after the genitalia have been stained and cleaned, the valvae are spread laterally with a pair of forceps; then, while holding the valvae apart, the apex of the aedeagus is pushed dorsally. This action should move the costae dorsolaterally and move the left brachium ventrally. At this point a small piece of glass is placed on top of the genitalia to hold the parts in the desired position. Caution must be exercised to prevent disarticulating the tegumen from the vinculum. The males of *Melanocinclis* are best mounted laterally or ventrolaterally.

The small size of the adult moths makes it desirable to mount them on minutens or small sized pins before the body has become dry (Hodges, 1959). They should never be glued on points because the scales, which are glued, come loose from the body with the result that the specimen drops off the point.

CLASSIFICATION

The moths discussed in this paper were placed in the Elachistidae until 1871 when Wocke placed many genera in a new family Lavernidae, without formally defining the group. In 1876, basing his classification primarily on wing venation, Wocke erected two monogeneric families, Batrachedrae (*sic*) and Cosmopterygidae, and placed the following genera in the Lavernidae: *Cyphophora*, *Laverna*, *Limnaccia*, *Ascalenia*, *Mompha* (*rhamniella*), *Stagmatophora*, *Pyroderces*, *Stathmopoda*, *Heinemannia*, *Blastodacna*, *Tebenna*, *Chrysoclista*, and *Psacaphora*. Meyrick (1909), also on the basis of venation, defined the Cosmopterygidae as follows: "I have come to the conclusion that the family *Elachistidae* as formerly understood by myself is heterogeneous, and includes forms of various origin. I use the family name *Cosmopterygidae* to include those genera with long sickle-shaped palpi, fore-wings lanceolate or linear, with veins 7 and 8 stalked, 7 to costa, hind-wings lanceolate or linear, with veins 2-5 separate, nearly parallel, 3 from before angle of cell. 6 and 7 more or less approximated towards base. Characteristic genera of this family are *Cosmopteryx*, *Stagma-*

tophora, *Limnoccia*, and *Mompha*; but *Elachista* itself does not belong here. I regard the family as a development of the *Oecophoridae*, and believe I have a complete series of transitional forms." Walsingham (1891), using *Tineidae* as an inclusive family, listed the West Indian genera considered by this paper under *Cosmopteryginae*, *Laverninae*, and *Batrachedrinae*, and in 1909 he grouped the Central American genera under *Lavernidae*. This concept is the same as Meyrick's *Cosmopterygidae*.

Spuler (1910) placed the European species in the new taxon *Momphidae* which was subdivided into the *Momphinae* and *Cosmopteryginae*. The *Momphinae* included *Pancalia*, *Stigmatophora*, *Mompha*, *Anybia*, *Ascalenia*, *Sorhagenia*, *Limnaecia*, *Cyphophora*, *Psacaphora*, *Tebenna*, *Chrysoclista*, *Spuleria*, *Heinemannia*, and *Blastodacna*; the *Cosmopteryginae* included *Tetanocentria*, *Batrachedra*, *Eustaintonia*, *Pyroderces*, *Stathmopoda*, and *Cosmopteryx*. Subsequent authors have used *Cosmopterygidae*, *Momphidae*, or *Lavernidae*, depending upon their concepts of priority and validity of the names.

Busck (1932) distinguished between two groups as follows: "The genus [*Teladoma*] belongs to the family *Cosmopterygidae* as distinguished from the *Momphidae* (*Lavernidae*). The two families have been confused and united under the former name by European and American authors, the writer included, but they have no close relationship and must be retained as separate families. This will be the subject of a forthcoming paper. The *Momphidae* have symmetrical male genitalia . . . and the *ostium* of the female not protruding beyond the body wall." This was the first time that characters other than the venation were used to define the two families, and Clarke (1941, 1955) followed Busck's definition in assigning genera to the *Cosmopterigidae*.

I do not believe that any of the preceding systems of classifying these moths is wholly satisfactory. When characters of the male and female genitalia are used in conjunction with characters of the venation and of the head, three relatively distinct groups are evident. The basic problem is to determine the sets of characters which can be used to define suprageneric categories. If the venation is used exclusively, then one classification is obtained. If the male genitalia are used, then another, and so on. It seems as though a natural classification is best obtained by a combination of sets of characters such as the male and female genitalia, the venation, the maxillary and labial palpi, the antennae, the nature of the scales on the head and other parts of the body, the shape of the wings, the setal patterns of the larvae, and the pupae. However,

this has its problems. I have used several sets of characters in defining three groups; but when the characters seem to disagree as to probable relationship, I have turned to the male genitalia as the ultimate criterion. At present, adequate material of the immature stages is not available to work out a classification based upon their characters.

The Cosmopterigidae is defined as follows: head smooth-scaled; tongue developed, scaled; maxillary palpi folded over base of tongue; labial palpi recurved, smooth (or slightly rough) scaled, apex acute; antennae two-thirds to one, simple or ciliate, pecten present or absent, scape elongate. Metathoracic tibiae often with long dorsal scales. Forewings broadly lanceolate with apex rounded to lanceolate with apex acuminate; 11 or 12 veins present; 1b furcate basally; 1c present or absent, usually absent; 2 before end of cell; 7 and 8 stalked, 7 to costa; 11 from central area of cell. Hindwings broadly lanceolate and apex rounded to linear, cell open or closed; 4 to 8 veins present; 6 and 7 divergent, 7 to costa. Male genitalia asymmetrical; *valvae* latero-ventral or ventral; *costae* free or fused with *valvae* (in several genera right *costa* free, left *costa* free fused with *valva*), asymmetrical costal processes sometimes present but not in those forms having free *costae*; *tegumen* broad, heavily sclerotized; *uncus* and *socii* absent; *brachia* asymmetrical; *aedeagus* heavily sclerotized, usually ankylosed, *cornuti* present or absent; *juxta* and *transtilla* usually not recognizable; 7th and 8th abdominal segments specialized to form plates, rods, or valvae-like structures in several genera; abdominal hair pencils present or absent. Female genitalia: *corpus bursae* membranous; *ductus bursae* membranous or sclerotized; *signa* present or absent; *lamellae vaginales* forming a tube-shaped structure in several genera.

This definition includes a wide variety of forms whose common denominator is the male genitalia. It appears as though this group may have arisen from the Oecophoridae through a form which lacked the *uncus* and *socii*. This would explain the type of venation common to some cosmopterigids and oecophorids. The hind-wing venation, used by Meyrick to define the Cosmopterigidae, is probably the result of convergence.

The second group is the Momphidae which is defined as follows: head smooth-scaled; tongue developed, scaled; maxillary palpi folded over base of tongue; labial palpi recurved, smooth-scaled, apex acute; antennae two-thirds to one, simple or ciliate, pecten present or absent, scape short or elongate. Metathoracic tibiae with long dorsal scales in some forms. Forewings lanceolate, apex

rounded to falcate, often with raised scales; 9, 10, 11, or 12 veins present; 1b simple or furcate basally, 1c present or absent; 2 at or before end of cell; 5 separate or fused with 4; 7 and 8 stalked, 7 to costa; 11 from middle half of cell. Hindwings lanceolate to linear; 5, 6, 7, or 8 veins present; 1b simple or furcate basally; 1c present or absent; 2, 3, and 4 usually subparallel; 5 and 6 separate, connate or stalked; 7 to costa. Male genitalia: symmetrical; *valvae* simple or divided with *costae* free apically; *sacculus* often well developed and long; *aedeagus* not ankylosed, slender or stout, *cornuti* present or absent; *juxta* usually present, *furca* often highly developed as two plates; *transtilla* present or absent; *tegumen* broad, heavily sclerotized; *uncus* and *gnathos* present or absent (both may be present, one or other may be absent but not both); *socii* absent; arms of *gnathos* free or fused, often with a spined process. Female genitalia: *bursa copulatrix* membranous or sclerotized, *ductus bursae* sometimes with accessory diverticula, *signa* present or absent.

Two well marked groups are included in the preceding definition: *Mompha* and allies and *Blastodacna* and allies. In the former group the *costae* are usually separate from the *valvae* apically; the *juxta* is moderate; the *uncus* is present; and the *gnathos* is absent. In the latter group the *valvae* usually are simple; the *juxta* often has two large, separate lobes; the *uncus* is usually absent; the *gnathos* is present, and each *brachium* when present has a spined process. But, it is possible to follow a series of specimens, starting with *Batrachedra* and some closely related genera and continuing through *Zaratha pterodactylella* Wlk., which seem to link the two groups. For this reason I am including both in the Momphidae. It appears as though the Momphidae were derived from the same group which may have given rise to the Blastobasidae, Oecophoridae, and Elachistidae.

The third group, present in the old concept of Cosmopterigidae, is the Walshiidae. It is defined as follows: head smooth-scaled; tongue developed, scaled; maxillary palpi folded over base of tongue; labial palpi recurved, smooth-scaled, apex acute; antennae one-half to three-fourths, pecten present or absent, simple or ciliate, scape usually elongate, Metathoracic tibiae often with long or stout dorsal scales. Forewings lanceolate, apex rounded or acute, raised scales present or absent; 12 veins present; 1b furcate basally; 2 from three-fourths to five-sixths on cell; 2, 3, and 4 separate; 4 and 5 separate or connate; 6 separate or stalked with 7 and 8; 11 from one-half to two-thirds on cell. Hindwings lanceolate to linear; 8 veins present; 1b simple; 2, 3, and 4 equidistant, parallel;

4 and 5 approximate or connate; 6 and 7 stalked; veins in hind-wing sometimes evanescent. Male genitalia: symmetrical to asymmetrical; *valvae* simple or complex, separate or fused ventrally; *aedeagus* large, heavily sclerotized, ankylosed, heavily sclerotized *manica* articulating with *saccus*; *transtilla* usually absent; tegumen narrow; *uncus* present, simple or bifid; *socii* and *gnathos* absent; ventral surface of *tuba analis* often lightly sclerotized; a short sclerotized lobe extending from *vinculum* at point of articulation with *tegumen*; *saccus* developed or not; eighth segment modified into plates, rods, or glandular structures in some genera. Female genitalia: *bursa copulatrix* membranous or sclerotized; *signa* present or absent; *ostium* an opening in eighth sternite; eighth sternite simple or modified as an invagination around ostium; in some species seventh and eighth segments heavily sclerotized.

The Walshiidae form a natural group. For the present, however, I can not suggest a reasonable hypothesis as to their relationship with the other gelechioids.

MATERIAL EXAMINED

I wish to express my thanks to the following institutions and individuals for providing me with specimens (the letters in brackets indicate the abbreviations used in citing the location of specimens): United States National Museum [USNM], Cornell University [CU], American Museum of Natural History [AMNH], California Academy of Sciences [CAS], Los Angeles County Museum [LACM], University of California at Berkeley [UCB], Chicago Natural History Museum [CNHM], Illinois Natural History Survey [INHS], Michigan State University [MSU], University of Michigan [UM], Canadian National Collection [CNC], Museum of Comparative Zoology [MCZ], British Museum (Natural History) [BMNH], Dr. A. F. Braun [AFB], Mr. C. P. Kimball [CPK], Mr. M. O. Glenn [MOG], Dr. A. E. Brower [AEB], Dr. J. A. Powell [JAP], Dr. A. B. Klots [ABK], Dr. S. W. Frost [SWF], and Dr. J. G. Franclemont [JGF]. Material in my collection is indicated by [RWH].

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- Cosmopterygidae Wocke, in Heinemann, 1877 [1876]. Die Schmetterlinge Deutschlands und der Schweiz, 2: 520. Meyrick, 1909. Trans. Ent. Soc. London, 1909: 17. (*partim*).
- Lavernidae Walsingham, 1909. Biologia Centrali-Americana. Insecta. Lepidoptera-Heterocera, 4: 1. (*partim*). Forbes, 1923. The Lepidoptera of New York and neighboring states, Cornell Univ. Agric. Exp. Sta. Mem., 68: 318. (*partim*).
- Momphidae Spuler, 1910. Die Schmetterlinge Europas, 2: 381. (*partim*).

The description of the family is as given under the section on classification. The major point of separation of the Cosmopterigidae from the Oecophoridae and Momphidae is the asymmetry of the gnathos in the male genitalia; it differs from the Walshidae by the absence of the uncus and by the broad tegumen.

Ten genera and 67 species are recognized in the North American fauna. Of this number four genera and 29 species are described as new. *Stigmatophora*, as determined by the type of the genus, does not occur in North America. *Eteobalea* has been proposed for our species formerly included in *Stigmatophora* except *ceanothiella* and *gleditschiaeella* which have been transferred to *Periploca* in the Walshidae. *Pyroderces rileyi* is not congeneric with *P. argyrogrammos*, the type of the genus; therefore, *Sathrobrotia* has been proposed for *P. rileyi* and a new species. On the basis of the male genitalia *Antequera* does not belong in the Cosmopterigidae; it appears to go with some of the heliodinids.

The types of all of the North American genera and specimens of all of our species with the exception of *Cosmopterix chalybaeella*, which I do not know, have been examined. Of *Anoncia orites* I have seen only a sketch of the genitalia of the type.

The larval habits of cosmopterigids are diverse. *Cosmopterix* larvae are leaf miners in plants of the Gramineae, Cyperaceae, Leguminosae, Convolvulaceae, and Urticaceae. The known larvae of *Eteobalea* are gall makers on *Trichostema* (Labiateae); the larva of *Limnaecia phragmitella* feeds on the seeds of *Typha* spp. (Typhaceae); the larva of *Triclonella pergandeella* draws the leaflets of *Desmodium* or *Clitoria* (Leguminosae) together and feeds on the upper surface of the leaf; the known larvae of *Anoncia* are leaf miners on *Lantatum* (Verbenaceae) and *Sphacele* (Labiateae); and the larvae of *Sathrobrotia* are scavengers of plant materials.

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KEY TO THE GENERA OF COSMOPTERIGIDAE

1. Labial palpi evenly curved 2
 Labial palpi angulate between second and third segments 4
2. Labial palpi long, reaching well beyond vertex *Triclonella*
 Labial palpi short, not reaching beyond vertex 3
3. Veins 3 and 4 of hindwing approximate or connate *Anoncia*
 Veins 3 and 4 of hindwing distant *Teladoma*
4. Third segment of labial palpi rough-scaled *Melanocinclis*
 Third segment of labial palpi smooth-scaled 5
5. Veins 2 and 3 of forewings approximate *Sathrobrotia*
 Veins 2 and 3 of forewings not approximate 6
6. Tongue short; second segment of labial palpi tufted ventrally *Eteobalea*
 Tongue moderate; second segment of labial palpi not tufted
 (in North American forms) 7
7. Cell in hindwing closed *Limnaecia*
 Cell in hindwing open 8
8. Veins 1-4 of hindwing developed *Tanygona*, *Cosmopterix*
 Veins 1-4 of hindwing evanescent *Eralea*

KEY TO THE GENERA OF COSMOPTERIGIDAE BASED PRIMARILY ON THE MALE GENITALIA

1. Eighth sternite forming two lobes 2
 Eighth sternite not forming two lobes, modified into rods,
 or with sclerotized patches 8
2. Costae symmetrical 3
 Costae asymmetrical 6
3. Costae free 4
 Costae partially fused to aedeagus 5
4. Apex of left brachium more heavily sclerotized than base *Cosmopterix*
 Apex of left brachium not more heavily sclerotized than base *Eralea*
5. Apices of brachia slender (Fig. 57) *Melanocinclis*
 Apices of brachia tapering more rapidly to apex, broader
 (Fig. 49) *Tanygona*
6. Apex of left brachium blunt, heavily sclerotized *Eteobalea*
 Apex of left brachium acute 7
7. Valvae linear *Sathrobrotia*
 Valvae broad *Limnaecia*

8. Brachia fused distally	<i>Teladoma</i>
Brachia not fused distally	9
9. Brachia subequal in length	<i>Triclonella</i>
Right brachium reduced, much shorter than left brachium	<i>Anoncia</i>

Cosmopterix Huebner

(Figs. 7, 17, 21, 87)

Cosmopterix Huebner, [1826]. Verzeichniss bekannter Schmetterlinge (*sic*), 424.

Type: *Tinea angustipennella* Huebner, [1796]. Designated by Desmarest, in Chenu, Encyclopédie d'Histoire Naturelle. Papillons Nocturnes, 299, 1857.

Type: *Tinea zieglerella* Huebner, [1805–1810]. Designated by Walsingham, Biologia Centrali-Americana. Insecta. Lepidoptera-Heterocera, 4: 4, 1909.

Acceptance of the first type designation above would create confusion in a group which has been nomenclatorially stable for more than 100 years. This can be exemplified by the fact that Zeller, Snellen, Wocke, Clemens, Stainton, Walsingham, Durrant, Meyrick, Fletcher, Lower, Turner, Busek, Braun, and Bradley have described more than 130 species of *Cosmopterix* as defined by Walsingham. Therefore, I am drafting an appeal to the International Commission on Zoological Nomenclature requesting a *nomen conservandum* for *Cosmopterix* Huebner with *Tinea zieglerella* Huebner as type.

If one accepts the first type designation, then the following changes in our association of names with entities would have to be made: 1. *Cosmopterix* Huebner (= *Stathmopoda* Herrich-Schaeffer). This synonymy removes the name *Cosmopterix* from the Cosmopterigidae to the Heliodinidae. 2. Proposal of a new generic name for *Tinea zieglerella* Huebner. 3. Proposal of a new name for the group defined as the Cosmopterigidae in this paper. The better course would be to follow Walsingham's traditional type designation, which does not lead to confusion, in preference to Desmarest's type designation, which would result in a shift in concepts with concomitant confusion in the literature.

A second problem involves the identity of *Tinea zieglerella*. Earlier workers have associated *zieglerella* with *Gracillaria eximia* Haworth. However, instead of making *eximia* the junior synonym as it should be by reason of publication date (*zieglerella*, [1805–

1810]; *eximia*, [1828]), *eximia* has been treated as the senior synonym. It appears that early authors were more interested in having a name, *eximia*, which was connected with an organism than in having one, *zieglerella*, which was a *nomen inquirendum*. After careful study of the group, I affirm the association of the name *zieglerella* with the species which has been known as *eximia*, and I confirm the synonymy *zieglerella* Hubner (= *eximia* Haworth).

Cosmopteryx, Zeller, 1839. Isis von Oken, 32: 210. (Emendation).

Duponchel, 1845. Catalogue Méthodique des Lépidoptères d'Europe, 373. Stainton, 1854. Insecta Britannica. Lepidoptera: Tineina, 228, pl. 7, ff. 4a-h. Frey, 1856. Die Tineen und Pterophoren der Schweiz, 257. Stainton, 1870. Natural History of the Tineina, 12: 2-9. Wocke, in Heinemann, 1877 [1876]. Die Schmetterlinge Deutschlands und der Schweiz, 2: 521. Snellen, 1882. Vlinders van Nederland, Microlepidoptera, 2: 867. Meyrick, 1895. Handbook of British Lepidoptera, 662. Meyrick, 1897. Proc. Linn. Soc. New South Wales, 22: 338. Dyar, 1902 [1903]. List of the Lepidoptera of North America, Bull. U. S. Natl. Mus., 52: 534. Busck, 1906. Proc. U. S. Natl. Mus., 30: 707-713. Walsingham, 1909. Biologia Centrali-Americana. Insecta. Lepidoptera-Heterocera, 4: 4. Spuler, 1910. Schmetterlinge Europas, 2: 389, f. 152. Forbes, 1923. Lepidoptera of New York and neighboring states, Cornell Univ. Agric. Exp. Sta. Mem., 68: 331, f. 185. Busck, 1932. Proc. Ent. Soc. Washington, 34: 17, pl. 3, f. 1. McDunnough, 1939. Mem. S. California Acad. Sci., 2: 63.

Cosmopterix, Fletcher, 1928. Catalogue of Indian insects, pt. 16: 1. Kuroko, 1960. Esakia, 1: 9, pl. 4, ff. 3, 5, and 6.

Head smooth-scaled; tongue scaled, well developed; maxillary palpi folded over base of tongue; labial palpi recurved, not reaching vertex, smooth, third segment slightly longer than second; antennae nearly one, simple, pecten usually present, scape long and enlarged distally. Upper surface of metathoracic tibiae usually with flat lying scales, some species with scale tufts preceding the white streaks.

Forewings elongate lanceolate, apex acuminate; 12 veins present; 1b furcate basally; 2 from three-fourths on cell; 2, 3, 4, and 5 parallel; 5 approximate or connate with 6, 7, and 8; 6, 7, and 8 stalked; 11 from three-fifths on cell. Hindwings linear, a tuft of scales on costal margin; 6 or 7 veins present; 1 weak or absent, 5 absent; 2, 3, and 4 equidistant, parallel; 6 and 7 stalked, 6 from

7 at three-fourths of wing.

Male genitalia: *valvae* lobate, arising ventrolaterally, symmetrical (asymmetrical in *C. victor*); *costae* free, connected to *anellus* and to base of *valvae*; *aedeagus* heavily sclerotized with a basal process and two flanges near line of juncture of basal process; *anellus* heavily sclerotized; *tegumen* narrow; *uncus* and *socii* absent; *brachia* separate, asymmetrical, left *brachium* heavily sclerotized distally, right *brachium* short, lightly sclerotized.

Female genitalia: *bursa copulatrix* membranous; two small sclerotized patches on *ductus bursae* before juncture with *corpus bursae* in several species; two *signa* usually present, sometimes absent or single; *lamellae vaginales* heavily sclerotized; *lamella antevaginalis* usually snowshoe-shaped, occasionally tubular; eighth tergite usually membranous.

Species of *Cosmopterix* occur on all the continents with the exception of Antarctica; however, they are most numerous in the subtropics and tropics. Most of the known species have a restricted distribution, but one species, *C. attenuatella* Wlk., occurs in the southern United States, the Antilles, the Canaries, Africa, India, and Australia.

McDunnough (1939) lists seventeen species and three synonyms for the North American fauna. Of these *C. lespedezae* and *C. floridanella*, among the synonyms, are good species; and *C. nigrapunctella* is a synonym of *floridanella*. *C. unicolorella* is a synonym of *C. montisella*, and *C. hermodora* is a synonym of *C. clemensella*. I have seen no specimens of *C. chalybaeella*; however, Mr. Bradley (*in litt.*) has confirmed that it was not *C. gracilens* or *montisella* with which I had associated the name. This does not preclude the possibility that *chalybaeella* may equal one of the described species, but it seems as though the better course is to treat it as a separate species. Twelve new species are described in the present paper, bringing the number of known species of *Cosmopterix* for our fauna to twenty-eight.

KEY TO THE SPECIES OF COSMOPTERIX BASED UPON THE MACULATION

1. Basal lines of forewings very broad, confluent 2
 Basal lines of forewings narrow, separate 3
2. Apical 2 segments of antennae white, 7 bronze, 1 white ... *nitens*
 Apical 4 segments of antennae white, 5 leaden, 5 white
 *molybdina*
3. Thorax without lateral white or silver-blue lines 4
 Thorax with lateral white lines 9

4. Forewings with subdorsal basal line *bendidia*
- Forewings without a subdorsal basal line 5
5. Thorax without white markings dorsally; forewings with
basal silver-blue lines short and broad, dorsomedial line
basad of costomedial one *clandestinella*
- Thorax with white markings; forewings with basal silver-
blue lines narrow, costomedial line basad of dorsomedial
one 6
6. Costomedial line from base almost to fascia *opulenta*
- Costomedial line short 7
7. Apex of antennae white; outer silver spots bounding fascia
separate, costal spot offset apically 8
- Apex of antennae brown; outer silver spots bounding fascia
fused, not offset; dorsal surface of abdomen dark purplish
..... *pulchrimella*
8. Apical 8 segments of antennae white, remainder brown
..... *bacata*
- Apical 3 segments of antennae white, 5 brown, 4 white,
then brown *gemmiferella*
9. Costomedial line from base of forewings 10
- Costomedial line not from base of forewings 14
10. Fascia surrounding basal silver spots, extending basally to
one-third *quadrilinee'la*
- Fascia not surrounding basal silver spots, starting at one-
half 11
11. Fascia extending between outer silver spots as a narrow
line *floridanella*
- Fascia extending between outer silver spots broadly and
becoming wider beyond them 12
12. Apical segment of antennae gray or partly gray, 3 white,
6 gray, 1 white (or gray) 13
- Apical 4 segments of antennae white, 3 brown *minutella*
13. Apex of last antennal segment gray, apical 2 segments
white, 1 brown, 1 white *dicacula*
- Apical antennal segment gray, 3 white, 6 gray *dapifera*
14. Forewings olive-gray or light brown 15
- Forewings dark olive-brown or brown 17
15. Apical 3 or 4 segments of antennae white, 5 brown, 1 white
1 brown, 5 white *facunda*
- Apex of antennae gray-brown or brown 16
16. Costal cilia beyond fascia concolorous with base of wing
..... *delicatella*
- Costal cilia beyond fascia buff, not concolorous with base of
wing *fernaldella, ebriola, scirpicola*

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17. Forewings with a tuft of white scales in cilia; a small patch of silver-blue scales on dorsal margin at midpoint between fascia and apex *montisella*
Forewings (beyond fascia) with a blue-white line on dorsal margin to apex (occasionally this line somewhat incomplete) 18
18. Apex of antennae brown 19
Apex of antennae white 21
19. Apical segment of antennae partly brown *magophila*
Apical 2 segments of antennae brown 20
20. Apical 2 segments of antennae brown, 2 white *attenuatella*
Apical 2-1/2 segments brown, 1-1/2 white *damnosa*
21. Apical 3 or 4 segments of antennae white, 4 or 5 brown, 4 or 5 white, then brown *clemensella*
Antennal pattern different, usually second white area interrupted by a brown segment 22
22. Costomedial line longer than dorsomedial line 24
Costomedial line shorter than dorsomedial line, or equal to it 23
23. A white line on dorsal surface of metathoracic tarsi (2nd through 5th segments) *lespedezae*
Without a white line on dorsal surface of metathoracic tarsi *abditæ*
24. Outer silver-white spots bordered by black basally *inopis*
No black scales bordering outer silver-white spots *gracilens*

KEY TO THE SPECIES OF COSMOPTERIX BASED UPON THE MALE GENITALIA

1. Aedeagus linear (Fig. 26) *attenuatella*
Aedeagus sublinear or rounded 2
2. Aedeagus sublinear; basal projection cylindrical, not expanded basally 3
Aedeagus with distinct swelling at some point; basal projection expanded basally 5
3. Subcostal margin of valvae concave upward (in distal half), rising apically (Fig. 25) *bendidia*
Subcostal margin of valvae not concave upward in outer half 4
4. Apex of left brachium curved (Fig. 23) *molybdina*
Apex of left brachium blunt (Fig. 24) *pulchrimella*

5. Apical area of costae expanded, edge blunt (Fig. 28) *clandestinella*
 Apical area of costae not expanded, edge curved 6
6. Apex of left brachium elliptical, slightly expanded *lespedezae*
 Apex of left brachium not elliptical, expanded or not expanded 7
7. Left brachium strongly expanded at some point 10
 Left brachium linear, not strongly expanded 8
8. A distinct shoulder on costal projection (Fig. 38) *quadrilineella*
 Without a distinct shoulder on costal projection (Fig. 37) ... 9
9. Left brachium broad at apex (Fig. 37) *opulenta*
 Left brachium narrow at apex (Fig. 42) *bacata*
10. Apical half of left brachium offset in middle of heavily sclerotized portion (Fig. 36) *abdita*
 Apical half of left brachium not offset in middle of heavily sclerotized area 11
11. Left brachium with a constriction immediately before apex (Fig. 39) 12
 Left brachium without a constriction immediately before apex 15
12. Valvae quadrate distally (Fig. 39) *inopis*
 Valvae rounded distally (Fig. 22) 13
13. Left brachium expanded before middle (Fig. 22) 14
 Left brachium expanded at two-thirds (Fig. 30) *gracilens*
14. Apex of aedeagus one-half maximum width of aedeagus (Fig. 22) *nitens*
 Apex of aedeagus one-fourth maximum width of aedeagus (Fig. 41) *gemmiferella*
15. Distal portion of aedeagus widest at base, tapering to apex (Fig. 32) 16
 Distal portion of aedeagus not widest at base 21
16. Subcostal margin of valvae deeply concave, outer margin moderately straight (Fig. 32) *dapifera*
 Subcostal margin of valvae not deeply concave, outer margin curved 17
17. Apical half of left brachium enlarged, apex blunt (Fig. 47) *floridanella*
 Apical one-fourth to one-third of left brachium enlarged 18
18. Apex of left brachium blunt 19
 Apex of left brachium pointed 20
19. Expansion of left brachium gradual (Fig. 33) *delicatella*
 Expansion of left brachium abrupt (Fig. 34) *dicacula*

20. Costal projection expanding gradually to widest point *magophila*
 Costal projection expanding abruptly to widest point (Fig.
 27) *montisella*
21. Apex of left brachium blunt, slightly upturned dorsally
 (Fig. 31) *minutella*
 Apex of left brachium tapering to apex 22
22. A shoulder or slightly produced area at two-thirds on dorsal
 margin of costae (Figs. 40, 43) *clemensella*, *damnosa*
 Dorsal margin of costae without a distinct angle (Figs. 45,
 46) 23
23. Apical one-half of left brachium tapering, convex up, to apex
 (Fig. 45) *fernaldella*
 Apical one-half (or one-half to one-fourth) of left brachium
 tapering, concave up, to apex (Fig. 46) 24
24. Dorsal expansion of left brachium with a sharp angle, taper-
 ing abruptly to apex (Fig. 46) *ebriola*
 Dorsal expansion of left brachium without a sharp angle,
 tapering more gradually to apex (Fig. 44) *scirpicola*

KEY TO SPECIES OF COSMOPTERIX BASED UPON THE
 FEMALE GENITALIA

1. Signum present 2
 Signum absent *attenuatella*
2. Base of lamella antevaginalis bifurcate (Fig. 96) ... *lespedezae*
 Base of lamella antevaginalis rounded or truncate 3
3. Ductus bursae with a small sclerotized area near juncture
 with corpus bursae (Fig. 102) 4
 Ductus bursae without a small sclerotized area near junc-
 ture with corpus bursae 14
4. Two signa 5
 One signum *opulenta*
5. Basal portion of lamella antevaginalis narrow, sharply
 constricted from distal portion 6
 Basal portion of lamella antevaginalis broad, if narrow,
 gradually tapering 11
6. Posterior edge of seventh sternite emarginate 7
 Posterior edge of seventh sternite not emarginate *dapifera*
7. Medial area of emargination produced, truncated (Fig.
 102) *floridanella*
 Medial area of emargination not produced, or, if so with
 a curved margin 8

8. Apophyses anteriores shorter than lamella antevaginalis 9
 Apophyses anteriores longer than lamella antevaginalis
 (Fig. 105) *scirpicola*
9. Signa subcircular (Fig. 100) *ebriola*
 Signa elliptical (Fig. 99) 10
10. Linear portion of lamella antevaginalis one-fourth or less
 entire length of lamella; sclerotized area around signa
 well defined *clemensella*
 Linear portion of lamella antevaginalis one-third or more
 entire length of lamella; sclerotized area around signa
 poorly defined distally *fernaldella*
11. Lamella antevaginalis truncated or rounded basally (Fig.
 94) 12
 Lamella antevaginalis tapering basally (Fig. 107)
 *gemmaferella*
12. Posterior edge of seventh sternite emarginate 13
 Posterior edge of seventh sternite not emarginate *facunda*
13. Length of lamella antevaginalis more than three times
 maximum width (Fig. 103) *inopis*
 Length of lamella antevaginalis approximately twice that
 of maximum width (Fig. 94) *quadrilineella*
14. Lamella antevaginalis subelliptical (Fig. 92) *pulchrimella*
 Lamella antevaginalis linear or hamate (Figs. 93, 101) 15
15. Lamella antevaginalis linear (Fig. 89) 17
 Lamella antevaginalis not linear (Fig. 93) 16
16. Greatest width of lamella antevaginalis in distal
 half *montisella*
 Greatest width of lamella antevaginalis in basal half *bendidia*
17. Posterior edge of seventh sternite with medial area pro-
 duced (Fig. 95) 18
 Posterior edge of seventh sternite with medial area not
 produced (Fig. 88) *nitens*
18. Medial area of posterior edge of seventh sternite strongly
 produced (Fig. 95) *clandestinella*
 Medial area of posterior edge of seventh sternite slightly
 produced (Fig. 89) *molybdina*

Cosmopterix nitens Walsingham
 (Figs. 22, 88, 135)

Cosmopterix nitens Walsingham, 1889. Ins. Life, 1:289. Dyar,
 1902 [1903]. List of the Lepidoptera of North America, Bull.

U. S. Natl. Mus., 52: 535. Busck, 1906. Proc. U. S. Natl. Mus., 30: 712. McDunnough, 1939. Mem. S. California Acad. Sci., 2: 63.

Tongue shining silver-yellow. Labial palpi bronze colored, paler basally and on inner surface of second segment. Antennae bronze colored; pecten present; ventral surface of scape white; apical two segments white, preceded by seven bronze, one white, then bronze colored segments. Forewings bronze colored basally and apically; an oblique, transverse silver-blue fascia at one-fourth, a transverse silver-blue fascia slightly beyond one-half, and another such fascia at three quarters; between outer bluish fasciae a straw colored one interrupted by a black dash near costal margin; a row of silver-blue scales along outer margin to apex of cilia; slightly paler than basal area. Hindwings dark fuscous-brown. Legs bronze colored; metathoracic tibiae with a dorsal white line from base to one-fourth; a white annulation at middle and at apex; first, second, and third tarsal segments tipped with white; fourth and fifth tarsal segments white.

Male genitalia: (Fig. 22) R.W.H. slide no. 949.

Female genitalia: (Fig. 88) R.W.H. slide no. 402.

Alar expanse: 8-10 mm.

Food plant: unknown.

Type: British Museum (Natural History).

Type locality: Southwest Texas.

Specimens examined: 5 ♂, 9 ♀. ALABAMA: Theodore, 2 ♀, June 12, 1917 [CU]; Leroy, 1 ♀, June 11, 1917 [CU]. TEXAS: no locality, 4 ♂, 6 ♀ [AMNH, USNM]; no locality, 1 ♀, March 2, 1886 [BMNH].

C. nitens can be separated from *C. molybdina* by the difference in color, bronze of *nitens* and leaden of *molybdina*, and by the two apical segments of the antennae being white. The male and female genitalic characters are given in the keys.

Cosmopterix molybdina, new species

(Figs. 28, 89, 136)

Head, thorax, forewings, abdomen, and legs shining lead colored. Labial palpi lighter (gray) basally. Antennae with pecten absent; apical four segments white, preceded by five lead colored, five white, then lead colored segments. Forewings not as shining as other surfaces; a broad bluish-silver fascia at one-fourth, one at one-half, and an oblique one at three-fourths; area between outer fasciae concolorous with wing or bright yellow-orange; a few white scales

in cilia at apex. Hindwings dark fuscous. Legs unicolorous except for metathoracic tibiae having a white annulation at middle and apex.

Male genitalia: (Fig. 23) R.W.H. slide no. 845.

Female genitalia: (Fig. 89) R.W.H. slide no. 846.

Alar expanse: 9–10 mm.

Food plant: unknown.

HOLOTYPE: ♂, Bar Harbor, MAINE, July 13, 1936 (A. E. Brower), [CU Type No. 3815].

PARATYPES: 1 ♂, 6 ♀, same data as type with dates June 30, 1936, July 10 and 15, 1938 [AEB, MOG, RWH].

Other specimens examined: Berkeley Hills, back of U. of California, CALIFORNIA, 1 ♂, April 17, 1959 (C. W. O'Brien), [UCB].¹

C. molybdina can be separated from *C. nitens* by the coloration: *molybdina* is leaden; *nitens* is bronze. The male genitalia can not be consistently separated from those of *C. pulchrimella*; however, the maculation of the insects is so different that there should be no cause for confusion.

***Cosmopterix pulchrimella* Chambers**

(Figs. 24, 92, 137)

Cosmopterix pulchrimella Chambers, 1875. Cincinnati Quart. Jour. Sci., 2: 231. Forbes, 1923. Lepidoptera of New York and neighboring states, Cornell Univ. Agric. Exp. Sta. Mem., 68: 332.

Cosmopterix pulcherrimella Chambers, 1878. Bull. U. S. Geol. Geog. Surv. Terr., 4: 137. Dyar, 1902 [1903]. List of the Lepidoptera of North America, Bull. U. S. Natl. Mus., 52: 535. Busek, 1906. Proc. U. S. Natl. Mus., 30: 709. McDunnough, 1939. Mem. S. California Acad. Sci., 2: 63.

Tongue olive-buff, slightly darker at tip. Maxillary palpi silver-gray-green. Labial palpi olive-brown with white lines: one on ventral, inner, and outer surfaces of second segment; one on

¹ This specimen agrees with the type series in nearly all aspects, and, if it had been collected in eastern North America, or, if the species were known by examples collected from localities between Maine and California, then I would have made it a paratype.

anterior and posterior surfaces of third segment. Antennae olive-brown; pecten present; ventral surface of scape white; scape with an anterior white line continued on shaft as a series of dots to one-half; apical two segments brown, preceded by two white, five brown, one white, one brown, then two or three white segments. Face silver-gray, vertex olive-brown with a white line above each eye. Thorax olive-brown, a medial white line sometimes present, width variable. Forewings dark olive-brown basally and distally; three blue-white lines in basal area; a bright orange to orange-brown fascia at one-half, bordered internally and externally by a silver-blue fascia; a white streak on costa beyond orange-brown fascia and another at apex of wing; a blue-white spot in middle of outer margin. Hindwings fuscous-brown, cilia lighter shade of same color. Abdomen brown dorsally, silver-blue-white laterally and ventrally, eighth segment brown. Legs dark olive-brown; metathoracic tibiae with blue-white at middle and apex; apices of first four tarsal segments blue-white; fifth tarsal segment blue-white.

Male genitalia: (Fig. 24) R.W.H. slide no. 546.

Female genitalia: (Fig. 92) R.W.H. slide no. 850.

Alar expanse: 7-8 mm.

Food plant: *Parietaria pennsylvanica* Muhl. and *Pilea pumila* (L.). Busek (1906) gives the following discussion of the larva (in turn the notes originated with Miss Murtfeldt): "Feeds on rickweed (*sic*) (*Pilea pumila*), a succulent little plant of the nettle family, with adhesive, but not urticating leaves; mining, twisting, and crumpling them.

"Larva yellowish white, subcylindrical.

"Head shining black, with the diversions defined by narrow white lines. Cervical shield broad, oblong, with fine white central line. The sutures are very deep, giving the larva a moniliform aspect.

"These larvae are not confined to one mine, but may be seen wandering over the leaves and stems, cutting in between the two cuticles of a leaf and covering it with transparent spots of various sizes. They change to pupa under a fold of the leaf or between the wrinkles or not infrequently on the surface of the ground, protected by a very slight dingy cocoon. There seems to be several broods in a season."

Type: Museum of Comparative Zoology.

Type locality: Covington, Kentucky.

Specimens examined: 90 ♂, 20 ♀. ARIZONA: Madera Canyon, 5,600 feet, Santa Rita Mountains, Santa Cruz Co., 4 ♂, 2 ♀, September 12, 1959 (R. W. Hodges), [CU, RWH]. FLORIDA: Siesta Key,

Sarasota Co., 27 ♂, 4 ♀, January 28 through October 24 (C. P. Kimball), [CPK, RWH]; Homestead, 1 ♂, April 15, 1959 (D. O. Wolfenbarger), [CPK]. GEORGIA: Clarke Co., 5 ♂, April 5, 1924 (Richards), [ABK]. ILLINOIS: Putnam Co., 12 ♂, 3 ♀, April 24 through September 5 (M. O. Glenn), [MOG]; Arlington Hts., 1 ♂, August 12, 1949 (A. L. McElhose), [CNHM]. KANSAS: Onaga, 1 ♂?, "8/5 02" [MCZ]. KENTUCKY: L. Sandy R., Ellicott Co., 1 ♂, May 3, 1936 (Annette F. Braun), [AFB]. MINNESOTA: no locality, 1 ♂, August 15, 1903 [CU]. MISSOURI: Kirkwood, 4 ♂, 1 ♀, June 1 through July 29 (Murtfeldt), [CU]; no locality, 3 ♂, July 13 and 19 [USNM]; Columbia, 2 ♂ [AMNH]. NEW YORK: Monroe Co. 4 ♂, July 30 through August 13, 1949 (C. P. Kimball), [CPK]; Pelham, Westchester Co., 1 ♂, 2 ♀, July 23-27, 1954 (A. B. Klots), [ABK]; Rochester, 1 ♀, July 20, 1933 (A. B. Klots), [ABK]; Ithaca, Tompkins Co., 5 ♂, 1 ♀, May 19-27, 1931 (A. B. Klots), [ABK]; Ithaca, Six Mile Creek, Tompkins Co., 1 ♂, May 21, 1959 (R. W. Hodges), [RWH]. NORTH CAROLINA: Highlands, Macon Co., 1 ♂, July 18, 1958 (R. W. Hodges), [RWH]; Maxton, 1 ♂, April 23, 1944 (A. B. Klots), [ABK]; no locality, 2 ♂ (Morrison), [USNM]. OHIO: Cincinnati, 4 ♂, May 12 through September 21 (Annette F. Braun), [AFB, USNM]; 9 ♂, 5 ♀, under rearing record B. 744, emerged from June 18 through August 15 (Annette F. Braun), [AFB, RWH].

C. pulchrimella can be separated from *C. clandestinella* by the presence of a medial white line and by the basal lines in the forewings being narrow as contrasted with short and broad ones in *clandestinella*. The apex of the left brachium being blunt in the male genitalia usually serves to separate *pulchrimella* from *C. molybdina*. In the female genitalia *pulchrimella* has a subelliptical lamella antevaginals, whereas those of *molybdina* and *clandestinella* are linear.

Cosmopterix bendidia, new species

(Figs. 25, 93, 138)

Tongue shining pale yellow. Labial palpi white; second segment with three olive-brown lines: one internal, one external, and one dorsal; third segment with an internal and an external brown line. Face shining dark ochreous with purple reflections; vertex dark olive-brown with a white line above each eye. Antennae with pecten present; dark brown; scape white on ventral surface and with an anterior white line, continued on shaft to one-half; segments 1-4, 10, and 12-14 (some specimens 12 or 12-13) white, others

brown. Thorax dark olive-brown with tip of mesothorax silver-blue. Forewings dark olive-brown basally and apically; a bright yellow fascia at one-half; six silver-blue lines in basal area: one along costa from base to one-fourth tending dorsally, another slightly in from costa at one-third, a medial one costad of fold at one-fourth, a medial one dorsad of fold at one-third, a short one from base near dorsal margin, and one on dorsal margin from one-seventh to one-third; a narrow silver fascia bordering yellow fascia basally and two silver spots bordering fascia externally; a path of white scales in cilia costad of outer subcostal silver spot; a silver-blue line along dorsal margin to apex, starting beyond dorsal silver spot. Hindwings dark fuscous-brown. Abdomen dark brown dorsally, shining buff and silver ventrally. Legs shining buff basally, dark olive-brown distally; metathoracic tibiae with three silver-blue annulations: one basal, one medial, and one apical; a row of long setae on posterior surface on inner medial tibial spur; apices of tarsal segments pale gray.

Male genitalia: (Fig. 25) R.W.H. slide no. 541.

Female genitalia: (Fig. 93) R.W.H. slide no. 849.

Alar expanse: 6-8 mm.

Food plant: *Ipomoea* spp.

HOLOTYPE: ♂, Madera Canyon, 4,880 feet, Santa Rita Mts., Santa Cruz Co., ARIZONA, August 18, 1959 (R. W. Hodges), [CU Type No. 3795].

PARATYPES: same data as type with date range from July 11-September 7, 12 ♂, 1 ♀, [CU, RWII]; Paradise, Cochise Co., ARIZONA (no date or collector), [USNM]; Homestead, FLORIDA, 1 ♂ February 24, 1959 (D. O. Wolfenbarger), [CPK]; Clarke Co., GEORGIA, 1 ♂, May 1929 (A. G. Richards), [ABK]; Hyattsville, MARYLAND, 3 ♀, bred from morning glory, one issued February 18, 1910, two issued March 1910 (A. B. [usck]), [USNM]; Montclair, NEW JERSEY, 1 ♂, September 5 (W. D. Kearfott), [USNM]; Cincinnati, OHIO, 6 ♂, 3 ♀, under rearing record B. 2074 (on *Ipomoea*), 1 ♂, 1 ♀, emerged October 18, 1943, 1 ♀, emerged April 1944, others from July 4-22, 1944 (Annette F. Braun), [AFB]; Kerryville (sic) [Kerrville], TEXAS, 1 ♂, May 06 (F. C. Pratt), [USNM].

Other specimens examined: Oakland, NEW JERSEY, 1 ♂, August 24, 1948 (C. P. Kimball), [CPK]; Monteagle, TENNESSEE, 1, June 21, 1930 (A. G. Richards), [CU].

C. bendidia can be distinguished from the other North American species of *Cosmopterix* by the presence of a subdorsal basal line on the forewings. No other species examined has this line.

Cosmopterix attenuatella Walker

(Figs. 26, 90, 139)

- Gelechia attenuatella* Walker, 1864. List of the specimens of the Lepidopterous insects in the collection of the British Museum, 30: 1019. Walsingham, 1891 [1892]. Proc. Zool. Soc. London, 519, 545.
- Cosmopterix attenuatella*, Walsingham, 1897. Proc. Zool. Soc. London, 105. Dyar, 1902 [1903]. List of the Lepidoptera of North America, Bull. U. S. Natl. Mus., 52: 535. Busck, 1906. Proc. U. S. Natl. Mus., 30: 710. Walsingham 1907 [1908]. Proc. Zool. Soc. London, 265. McDunnough, 1939. Mem. S. California Acad. Sci., 2: 63. Ghesquière, 1942. Annales du Musée du Congo Belge, C. Zoologie, Series 3 (2), Tome 7, Fascicle 1: 70.
- ‡ *Cosmopterix lespediza* (sic) Dyar, 1901. Proc. Ent. Soc. Washington, 4: 478. (misidentification).
- Cosmopterix flavofasciata* Wollaston, 1879. Ann. Mag. N. H., series 5, 3: 438. Staudinger and Rebel, 1901. Catalog Lepidopteren des Palaearctischen Faunengebietes, 2: 185.
- Cosmopterix mimetis* Meyrick, 1897. Proc. Linn. Soc. New South Wales, 22: 339. Meyrick, 1909. Jour. Bombay Nat. Hist. Soc., 19: 417. Fletcher, 1921. Mem. Dept. Agric. India, Ent. Series, 6: 102.
- Cosmopterix mimetis*, Fletcher, 1928. Catalogue of Indian Insects, pt. 16: 4.
- Cosmopterix antillia* Forbes, 1931. Jour. Dept. Agric. Porto Rico, 4: 356. **new synonymy.**

Tongue white to pale yellow. Labial palpi white; an internal and an external dark brown line on second and third segments; apex of third segment white. Antennae dark brown; pecten present, scape with ventral surface and an anterior line white; anterior white line continued on shaft as a series of dots to three-fifths; apical two segments brown, preceded by two white, five brown, one white, one brown, one white, then by brown segments. Face shining buff-gray, becoming darker dorsally; vertex dark olive-brown with three white lines, one above each eye and one medial. Thorax dark olive-brown with continuation of white lines on vertex. Forewings dark olive-brown basally and distally; five white lines on basal half; a yellow to yellow-brown fascia at one-half bordered internally by a silver fascia, externally by two silver spots, one subcostal and one subdorsal; a few black scales following silver fascia below costa; a white streak in costal cilia from outer costal

spot; a white line along dorsal margin of wing from three-fourths to apex of cilia, interrupted in some specimens; cilia paler than base of wing. Hindwings gray. Abdomen shining gray dorsally with orange scales on medial area of several tergites; shining pale buff ventrally; last segment buff. Legs shining gray basally, brown distally; metathoracic tibiae with an oblique white line from base and one at two-thirds, apex white; tarsal segments shining gray on dorsal surface of segments one, two, three, and five, apices brown; a dorsal white line on prothoracic tibiae and segments one, two, three, and five of tarsi.

Male genitalia: (Fig. 26) R.W.H. slide no. 484.

Female genitalia: (Fig. 90) R.W.H. slide no. 926.

Alar expanse: $6\frac{1}{2}$ –8 mm.

Food plant: *Scirpus* sp.

Type: British Museum (Natural History).

Type locality: Jamaica.

Specimens examined: 79 ♂, 6 ♀.

FLORIDA: Archbold Biological Station, Highlands Co., 4 ♂, 1 ♀, March 29–April 2, 1959 (R. W. Hodges), [RWH]; same locality, 1 ♂, January 8, 1960 (S. W. Frost), [SWF]; Hastings, 1 ♂, “19C” [MCZ]; Homestead, 10 ♂, 2 ♀, February 8–November 13, 1958 and 59 (D. O. Wolfenbarger), [CPK, RWH]; Chokoloskee, 1 ♂ [USNM]; Orlando, 7 ♂, February–April (G. G. Ainslie), [USNM]; Orlando, 1 ♂, August 17, 1945 (A. B. Klots), [ABK]; Royal Palm Park, 1 ♂, April 10, 1938 (F. E. Watson and L. J. Sanford), [AMNH]; Sarasota, 1 ♂, February 17, 1946 (Needham), [CU]; Siesta Key, Sarasota Co., 49 ♂, 3 ♀, dates in March, April, November, and December (C. P. Kimball), [CPK, RWH]; Winter Park, 1 ♂, July 27, 1933 (H. T. Fernald), [USNM]. TEXAS: Mercedes, 1 ♂, “1–7 1956” (Paul T. Riherd), [USNM].

See discussion under *C. lespedezae* concerning the synonymy of the two species.

C. attenuatella can be separated from *C. damnosa* by the characters given in the keys. The male genitalia with the linear aedeagus is distinct from the other species of North American *Cosmopterix*.

***Cosmopterix clandestinella* Busck**

(Figs. 28, 95, 140)

Cosmopterix clandestinella Busck, 1906. Proc. U. S. Natl. Mus., 30: 712. Barnes and McDunnough, 1917. Check list of the Lepidoptera of Boreal America, 152. Forbes, 1923. Lepidop-

tera of New York and neighboring states, Cornell Univ. Agric. Exp. Sta. Mem., 68: 333. McDunnough, 1939. Mem. S. California Acad. Sci., 2: 63.

Tongue shining yellow-white. Labial palpi: second segment buff with a dorsal brown line; third segment brown with a broad, white dorsal line. Face pale silver-yellow with purple reflections; vertex olive-brown with a blue-white line above each eye. Antennae with pecten present; dark brown; scape white ventrally and with an anterior white line continued on shaft as a series of dots to three-fifths; ventral surface of shaft white to one-half; apical three segments white, preceded by five brown, three white, then brown segments (in some specimens apical four white, preceded by four brown, three white). Thorax dark olive-brown, no silver-blue markings, anterior surface of patagia with purple reflections. Forewings dark olive-brown basally and distally; three short, broad silver-blue lines in basal area, costal one narrower than medial ones; a yellow-orange fascia at one-half, bordered internally and externally by a series of black scales; a silver-blue fascia basad of yellow-orange fascia; beyond yellow-orange fascia a silver-blue spot extending from dorsal margin to middle of wing; a silver-blue spot offset apically from dorsal one below costal margin with a white streak extending from it into costal cilia; apical cilia white; a few silver-blue scales along dorsal margin in apical fourth. Hindwings dark fuscous. Abdomen shining dark ochreous dorsally, olive-brown laterally, shining white ventrally; last segment brown. Legs shining buff with purple reflections basally; dark olive-brown distally; metathoracic tibiae with three dorsal tufts of scales: one at one-third, two thirds, and apex; each tuft preceded by silver-blue scales; apex white to buff; penultimate and ultimate tarsal segments shining white.

Male genitalia: (Fig. 28) R.W.H. slide no. 400.

Female genitalia: (Fig. 95) A. Busck slide.

Alar expanse: 7-8 mm.

Food plant: *Panicum clandestinum* L. Busck (1906) gives the following description of the mine and larva: "The mine is an irregular longitudinal clear blotchmine with the frass ejected at one end. The larva is light green with short light hairs and with yellow head and thoracic shield. At maturity it assumes a brilliant wine-red color in three broad longitudinal stripes, and cuts a circular piece off of the epidermis of its mine, which it bends lengthwise and uses for a cocoon exactly like the genus *Cycloplasis* Clemens."

Type: United States National Museum.

Type locality: Washington, D. C.

Specimens examined: 23 ♂, 21 ♀. KENTUCKY: Powell Co., 1 ♂, 1 ♀, under rearing record B. 927, emerged May 28 and June 9, 1917 (Annette F. Braun), [AFB, USNM]; Natural Bridge, McCreary Co., 1 ♂, October 10, 1950 on *Panicum*, issued May 10, 1951 (Annette F. Braun), [AFB]. MARYLAND: Washington D. C., 6 ♂, 10 ♀, Busck rearing, emerged July 20, 1899, August 10, 1902, August 12, 1919, and July 1928 (August Busck), [USNM]; Hyatts-ville, 1 ♂, 4 ♀, Busck rearing, emerged August 1906 and August 9-11, 1913 [USNM]; Plummer's Id., 1 ♂, 1 ♀, June 3, 1914 (R. C. Shannon), [USNM]. MASSACHUSETTS: Woods Hole, 1 ♂, July 18, 1919 [CU]. NEW JERSEY: Caldwell, 1 ♂, 1 ♀, July 8, 1900 (W. D. Kearfott), [USNM]; Essex Co. Park, 1 ♂, June 22 (W. D. Kearfott) [USNM]. NORTH CAROLINA: Balsam, 2 ♂, July 14 and 22, 1911 (Annette F. Braun), [AFB]. OHIO: Clermont Co., 1 ♂, May 31, 1917 (Annette F. Braun), [USNM]; Cincinnati, 1 ♂, 1 ♀, under rearing record B. 486, emerged August 2, 1909 (Annette F. Braun), [RWH]; same locality, 2 ♂, on *Panicum*, emerged May 29 and July 31, 1917 (Annette F. Braun), [USNM]; same locality, 1 ♂, June 7, 1908 (Annette F. Braun), [USNM]; same locality, 1 ♂, under rearing record B. 498, emerged August 3, 1909 (Annette F. Braun), [AFB]; same locality, 1 ♂, August 1, 1903 (Annette F. Braun), [USNM]; same locality, 1 ♀, under rearing record B. 486, emerged August 16, 1913 (Annette F. Braun), [USNM]; Conkle's Hol., Hocking Co., 1 ♂, on *Panicum clandestinum*, emerged April 2, 1944 (Annette F. Braun), [AFB]; Scioto Co., 1 ♀, on *Panicum*, emerged July 26, 1948 (Annette F. Braun), [AFB]. VIRGINIA: Falls Church, 1 ♂, June 2, 1914 (Heinrich), [USNM].

This species is closest to *C. pulchrimella* but may be easily distinguished from it by the absence of white markings on the thorax and the presence of broad silver-blue lines in the basal area of the forewings.

***Cosmopterix montisella* Chambers**

(Figs. 27, 101, 141)

Cosmopteryx montisella Chambers, 1875. Cincinnati Quart. Jour. Sci., 2: 297. Chambers, 1878. Bull. U.S. Geol. Geog. Surv. Terr., 4: 137. Dyar, 1902 [1903]. List of the Lepidoptera of North America, Bull. U. S. Natl. Mus., 52: 535. McDunnough, 1939. Mem. S. California Acad. Sci., 2: 63.

Cosmopteryx monticella (sic) Busek, 1906. Proc. U. S. Natl. Mus., 30: 712.

Cosmopteryx unicolorella Walsingham, 1889. Ins. Life, 1: 291.
new synonymy. Dyar, 1902 [1903]. List of the Lepidoptera of North America, Bull. U. S. Natl. Mus., 52: 535. Busek, 1906. Proc. U. S. Natl. Mus., 30: 710. McDunnough, 1939. Mem. S. California Acad. Sci., 2: 63.

Tongue shining buff. Labial palpi brown; second segment with three white lines: one ventral, one internal, and one external; third segment with an anterior and a posterior white line. Antennae brown; pecten present; ventral surface of scape white; an anterior white line on scape, continued on shaft as a series of dots to one-half or farther; apical four segments: three brown, one white; or, two brown, two white; or, one-half brown, three-and-one-half white. Apical four segments preceded by five brown, one white, one brown, two white, then brown ones. Face olive-brown with purple reflections; vertex dark olive-brown with three white lines, one above each eye and one medial. Thorax dark olive-brown with continuation of three white lines on vertex. Forewings dark olive-brown basally and apically; four white lines in basal area; a yellow-orange fascia at one-half; a silver-gray fascia bordering it inwardly; outwardly, yellow-orange fascia bordered by two silver-gray spots, one dorsal and one subcostal; subcostal spot offset apically from dorsal one; a white costal streak above subcostal spot; a broad white streak at apex of wing; a few silver-blue scales on dorsal margin midway between apex and dorsal spot. Hindwings fuscous. Abdomen brown and buff dorsally, brown with apices of segments silver ventrally. Legs silver-gray with purple reflections basally, brown distally; metathoracic tibiae with a dorsal line from base to one-half; a white annulation at two-thirds and one at apex; apices of tarsal segments buff to white.

Male genitalia: (Fig. 27) R.W.H. slide no. 537.

Female genitalia: (Fig. 101) R.W.H. slide no. 538.

Alar expanse: 10–13 mm.

Food plant: unknown.

Type: *montisella*, Museum of Comparative Zoology; *unicorella*, British Museum (Natural History).

Type locality: *montisella*, Spanish Bar, Colorado; *unicorella*, Siskiyou Co., California.

Specimens examined: 32 ♂, 17 ♀. ARIZONA: Madera Canyon, 4,880 and 5,600 feet, Santa Rita Mountains, Santa Cruz Co., 9 ♂, 9 ♀, July 9 through September 29, 1959 (R. W. Hodges), [CU,

RWH]; same data except 4,400 feet, Pima Co., 1 ♀, October 6, 1959 [RWH]; Santa Catalina Mountains, Pima Co., 1 ♂, August 1, 1938 (Bryant), [LACM]; Palmerlee, 1 ♂ [USNM]. CALIFORNIA: Mt. Shasta City, Siskiyou Co., 9 ♂, July 2-18, 1958 (J. Powell), [UCB, RWH]; Davis Creek, Modoc Co., 1 ♀, July 11, 1957 (J. Powell), [RWH]; Bear Creek, Shasta Co., 3 ♂, July 27-28, 1871 (Walsingham), [USNM, BMNH]; Mt. Shasta, Siskiyou Co., 1 ♂, August 2 through September 1, 1871 (Walsingham), [BMNH]; Hatchet Creek, Shasta Co., 1 ♂, July 14-17, 1871 (Walsingham), [BMNH]. COLORADO: Mesa Verde Natl. Park, 1 ♂, July 24, 1941 (A. B. Klots), [ABK]; Rocky Mountain Natl. Park, 2 ♂, July 15, 1937 (A. B. Klots), [ABK]. ILLINOIS: Arlington Hts., 1 ♀, September 18, 1940 (A. L. McElhose), [CNHM]; Putnam Co., 1 ♀, August 27, 1956 (M. O. Glenn), [MOG]. MICHIGAN: Livingston Co., 1 ♀, July 1, 1947 (J. Newman), [RWH]; Ecorse, Wayne Co., 2 ♀, September 4, 1951 and September 10, 1949 (Ralph Beebe), [AMNH, UM]. NEW MEXICO: Little Tesuque Canyon, vic. Santa Fe., 1 ♀, July 27 through August 10, 1932 (A. B. Klots), [ABK]. NEW YORK: Ithaca, Six Mile Creek, 1 ♂, June 6, 1957 (J. G. Franclemont), [JGF]; Ithaca, 1 ♂, 1 ♀, July 5, 1924 and September 1, 1919 (W.T.M.F.), [CU]. OREGON: Glide, 1 ♂, August 19, 1954 (D. R. Davis), [DRD]. PENNSYLVANIA: New Brighton, 1 ♂, June 28, 1907 (Merrick), [USNM].

C. montisella can be separated from *C. clemensella* by the patch of silver-blue scales on the outer margin of the forewing. The keys will identify the species by the male and female genitalia.

This species has a tendency toward melanism which is expressed by the replacement of the yellow-orange fascia by scales concolorous with the basal area of the forewing. The specimen from Mesa Verde National Park is a melanic. Walsingham's species, *unicolorella*, is based on a melanic specimen of *montisella*. Mr. J. D. Bradley has very kindly sent me photographs of the male genitalia of the type of *unicolorella*, and they agree very well with those of *montisella*.

There is a moderate amount of variation in this species both in alar expanse and coloration; however, the characters emphasized in the keys have been diagnostic for the specimens seen.

Cosmopterix magophila Meyrick

(Figs. 29, 142)

Cosmopteryx magophila Meyrick, 1919. Exot. Micr., 2: 282. McDunnough, 1939. Mem. S. California Acad. Sci., 2: 63.

Tongue shining pale buff. Labial palpi white, second segment with some black scales dorsally and ventrally, third segment with a black line on inner surface and one on outer surface. Antennae dark brown; pecten present; ventral surface of scape and shaft white; a white line on anterior surface of scape; apical one-half segment of shaft brown, preceded by three-and-one-half white, five brown, one white, one brown, one or two white, then brown segments. Face pale buff-bronze; vertex dark olive-brown with three white lines, one above each eye and one medial. Thorax dark olive-brown with continuation of three white lines on vertex. Forewings dark olive-brown basally and apically; four white lines in basal area; a yellow fascia at one-half; fascia bordered inwardly by two pale gold spots, costal one based of dorsal one; costal spot followed by a small patch of black scales; outwardly, fascia bordered by two pale gold spots; a white streak in costal cilia from outer costal gold spot; a white line along outer margin to apex of cilia. Hindwings dark fuscous. Abdomen dark fuscous, anal segment pale buff. Legs buff basally, brown distally; metathoracic tibiae white at base, middle, and apex; outer tibial spurs white on outer surface; tarsi white ventrally and at apices of segments.

Male genitalia: (Fig. 29) R.W.H. slide no. 480.

Female genitalia: Unknown.

Alar expanse: 7-8 mm.

Food plant: unknown.

Type: British Museum (Natural History).

Type locality: Southern Pines, North Carolina.

Specimens examined: 4 ♂. NORTH CAROLINA: Maxton, 2 ♂, May 11 and 16, 1944 (A. B. Klots), [ABK]; Southern Pines, 1 ♂, ".18" (P.), [USNM]; same locality, 1 ♂, August 8-15 [USNM].

C. magophila can be distinguished from *C. clemensella* and *C. damnosa* by the outer one-half of the apical segment of the shaft of the antennae being brown; *clemensella* has the apex of the antennae white, and *damnosa* has the apical two-and-one-half segments of the antennae brown. The male genitalia of *magophila* are closest to *C. montisella*; here, the gradual expansion of the costal projection to the widest point will separate it from *montisella*.

Cosmopterix gracilens, new species

(Figs. 30, 143)

Tongue shining buff-white. Labial palpi white with an internal and an external olive-brown line. Antennae dark olive-brown; pecten present; scape with ventral surface and an anterior line

white; anterior white line continued on shaft to two-thirds; apical four segments white, preceded by five brown, one white, one brown, two white, three-and-one-half brown, then by a series of segments one-half white and one-half brown. Face shining buff-yellow with purple reflections; vertex dark olive-brown with three blue-white lines, one above each eye and one medial. Thorax dark olive-brown with continuation of three lines on vertex. Forewings dark olive-brown basally and distally; four blue-white lines on basal one-half, costomedial line longer than dorsomedial line; a lemon-yellow fascia at two-thirds, preceded by a silver fascia not reaching costal margin; outwardly, yellow fascia bordered by a subcostal and a dorsal silver spot; one or two black scales following silver fascia costomedially, and one or two black scales preceding dorsal silver spot; a white streak in costal cilia from yellow fascia; a blue-white line along outer margin of wing from end of yellow fascia to apex of cilia; cilia concolorous with base of wing. Hindwings dark gray-brown. Legs golden basally, dark olive-brown distally; metathoracic tibiae with a white streak from base to one-fourth, an oblique white streak from middle spur, apex white, outer surface of outer tibial spurs white; metathoracic tarsi with a white streak at base of first segment, apex buff, other segments missing on this specimen.

Male genitalia: (Fig. 30) R.W.H. slide no. 933.

Female genitalia: no specimens available.

Alar expanse: 10 mm.

Food plant: unknown.

HOLOTYPE: ♂, Palmerlee, ARIZONA [USNM Type No. 66079].

C. gracilens can be separated from *C. inopis* by the absence of an internal black border before the outer silver spots on the forewings. The male genitalia of *gracilens* can be separated from those of *inopis* by the rounded outer margins of the valvae; the valvae of *inopis* have the outer margins quadrate.

***Cosmopterix dapifera*, new species**

(Figs. 32, 91, 144)

Tongue shining white. Labial palpi white with two dark olive-brown lines on second and third segments, one internal and one external. Antennae with pecten present; olive-brown; scape white ventrally and with an anterior white line continued on shaft to one-sixth; apical segment of shaft dark, preceded by three white, six olive-brown, one gray, then olive-brown ones. Face shining buff; vertex pale olive-brown with three blue-white lines, one above each

eye and one medial. Thorax pale olive-brown with five blue-white lines: one on outer margin of patagia, one on inner margin of patagia, and one medial. Forewings olive-brown (fading to pale olive-brown) basally and apically; four blue-white lines in basal area; a bright yellow-orange fascia from one-half to three-fourths bounded inwardly by two silver spots, one on dorsal margin and one medial; a few orange-brown scales preceding silver spots; a dorsal and a costal silver spot present within apical portion of fascia; some black scales usually preceding outer silver spots and succeeding medial silver spot; a white line along dorsal margin from end of fascia to apex of cilia. Hindwings concolorous with basal area of forewings. Abdomen shining dark yellow-brown with purple reflections dorsally, ochreous basally. Legs shining buff or white; metathoracic tibiae with a brown line from base to middle and another from middle to slightly before apex; metathoracic tarsi olive-brown laterally.

Male genitalia: (Fig. 32) R.W.H. slide no. 542.

Female genitalia: (Fig. 91) R.W.H. slide no. 543.

Alar expanse: 8-9 mm.

Food plant: unknown.

HOLOTYPE: ♂, Madera Canyon, 4,880 feet, Santa Rita Mountains, Santa Cruz Co., ARIZONA, August 29, 1959 (R. W. Hodges), [CU Type No. 3797].

PARATYPES: same locality as type, 2 ♂, 1 ♀, July 19 and 24, September 5, 1959 [CU, RWH]; Clarke Co., GEORGIA, 1 ♂, April 4, 1929 (A. G. Richards), [ABK]; Monteagle, TENNESSEE, 1 ♂, June 12, 1930 (A. G. Richards), [CU].

This species can be separated from *C. minutella* by the antennal markings: the apical segment of *dapifera* is gray; that of *minutella* is white.

***Cosmopterix delicatella* Walsingham**
(Figs. 33, 145)

Cosmopteryx delicatella Walsingham, 1889. Ins. Life, 1: 290. Riley, in Smith, 1891. List of the Lepidoptera of Boreal America, 107. Kearfott, in Smith, 1903. Check list of the Lepidoptera of Boreal America, 116. Dyar, 1902 [1903]. List of the Lepidoptera of North America, Bull. U. S. Natl. Mus., 52: 535. Buseck, 1906. Proc. U. S. Natl. Mus., 30: 711. McDunnough, 1939. Mem. S. California Acad. Sci., 2: 63.

Tongue shining pale yellow. Labial palpi gray-white; second segment with three brown lines: one on inner surface, one on outer surface, and one on dorsal surface. Antennae olive-brown, pecten present; scape with ventral surface and an anterior line white; apical two segments of shaft brown, preceded by two white, five brown, one white, one brown, one white, then brown segments. Face shining olive-brown with purple reflections, yellow at base of tongue; vertex olive-brown with three white lines, one above each eye and one medial. Thorax concolorous with vertex; white lines of vertex continuing on thorax. Forewings gray-olive-brown basally and distally; four blue-white lines in basal area; a yellow fascia at one-half bordered internally by two silver-gray spots, one costomedial and one dorsal, costomedial spot basad of dorsal one; externally, fascia extending between a dorsal silver-gray spot and a costal white streak; a white line along dorsal margin from end of fascia to apex of cilia; dorsal cilia concolorous with basal area or slightly paler than basal area. Hindwings dark fuscous. Abdomen gray-brown dorsally, shining buff ventrally. Legs shining buff basally, brown distally; metathoracic tibiae with a dorsal white line from base to one-third; an oblique white line from ventral surface to dorsal surface, starting at one-half and terminating at two-thirds; apex white; dorsal surface and apices of metathoracic tarsal segments white.

Male genitalia: (Fig. 33) R.W.H. slide no. 902.

Female genitalia: no specimens available.

Alar expanse: 8-9 mm.

Food plant: unknown.

Type: British Museum (Natural History).

Type locality: North Carolina.

Specimens examined: 33 ♂. FLORIDA: Archbold Biological Station, Highlands Co., 2 ♂, March 27 and 29, 1959 (R. W. Hodges), [RWH]. MARYLAND: Washington, D. C., 1 ♂, July (A. Busck), [USNM]. MASSACHUSETTS: Barnstable, 25 ♂, June 1 through July 2, 1950-1952 (C. P. Kimball), [CPK, RWH]. MISSISSIPPI: Biloxi, 1 ♂, June 13, 1917 [CU]. NORTH CAROLINA: Southern Pines, 3 ♂, August 1-15 [USNM]; no specific locality, 1 ♂, 1883 (Morrison), [BMNH].

An examination of the type of *C. quadrilineella* and comparison with more material indicates that the difference in the number of metallic spots, cited by Walsingham (1889), is not valid. Chambers' specimens are worn, and the outer costal spot is not plainly indicated. In *quadrilineella* the costomedial line starts at the base of the forewing. It starts at a point distant from the base in *delicatella*.

Cosmopterix dicacula, new species

(Figs. 34, 146)

Tongue white. Labial palpi white, a pale brown line on outer surface of second and third segments. Antennae brown; pecten present; scape with ventral surface and an anterior line white; white line continued on shaft to one-half; apex of shaft gray, preceded by two white, one brown, one white, three brown, one white, one brown, one white, one brown, one white, then brown segments. Face shining buff; vertex pale brown with three white lines, one above each eye and one medial. Thorax brown with continuation of white lines on vertex. Forewings olive-brown basally; four white lines in basal area, costomedial one from base to fascia; a yellow fascia at two-thirds; internally, fascia bordered by a subdorsal and subcostal silver spot; externally, fascia bordered by a subdorsal and a subcostal silver spot; inner, subdorsal silver spot preceded by a few black scales; inner, subcostal silver spot succeeded by a few black scales; a white streak in costal cilia from outer silver spot; a white streak in dorsal cilia from outer silver spot; a white line along dorsal margin from fascia to apex of cilia; remainder of apical one-fourth pale gray-brown; dorsal cilia pale gray in apical area, yellow-white below fascia. Hindwings pale gray. Legs buff basally, olive-brown distally; metathoracic tibiae with an oblique white streak at base, one at one-half, and one at five-sixths, apex white; tarsi with a discontinuous, dorsal white line, apices of segments white.

Male genitalia: (Fig. 34) R.W.H. slide no. 101.

Female genitalia: no specimens available.

Alar expanse: $7\frac{1}{2}$ mm.

Food plant: unknown.

HOLOTYPE: ♂, Gainesville, FLORIDA, July 7, 1927, trap light (J. Speed Rogers), [CU Type No. 3800].

C. dicacula can be distinguished from *C. dapifera* by the antennae as stated in the key. In the male genitalia of *dicacula* the outer margin of the valvae is rounded, that of *dapifera* is relatively straight; the apex of the left brachium of *dicacula* is blunt, that of *dapifera* is pointed.

Cosmopterix lespedezae Walsingham

(Figs. 35, 96, 147)

Soc., 10: 198. Walsingham, 1891 [1892]. Proc Zool. Soc. *Cosmopteryx lespedezae* Walsingham, 1882. Trans. American Ent.

- London, 536, 548. *partim*. Walsingham, 1897. Proc. Zool. Soc. London, 105. (as synonym of *C. attenuatella*). Dyar, 1902 [1903]. List of the Lepidoptera of North America, Bull. U. S. Natl. Mus., 52:535. (as synonym of *C. attenuatella*). Busck, 1906. Proc. U. S. Natl. Mus., 30:710. (as synonym of *C. attenuatella*). Walsingham, 1907 [1908]. Proc. Zool. Soc. London, 965. (as synonym of *C. attenuatella*).
- ‡*Cosmopteryx magophila* Braun, 1930. Trans. American Ent. Soc., 56:9. misidentification.

Tongue shining pale buff. Labial palpi olive-brown; second segment with three white lines: one internal, one external, and one ventral; third segment with an anterior and a posterior white line. Face shining buff-brown; vertex olive-brown with three silver-blue lines, one above each eye and one medial. Antennae dark olive-brown; pecten present; scape with an anterior white line, ventral surface white; shaft with white ventral surface to one-half and an anterior white line to two-thirds; apical four segments white, preceded by five brown, one white, one brown, then three white segments with brown on distal, posterior half (some specimens with four white, five brown, one white, one brown, two white, four brown, then four brown basally, white distally). Thorax olive-brown with five blue-white lines; one on outer margins of patagia, one on inner margins of patagia, and one medial. Forewings with basal and apical areas dark olive-brown; four silver-blue lines on basal half; a pale yellow fascia at one-half bordered basally by two silver spots and apically by two silver spots; a white streak in costal cilia beyond fascia; a white line from fascia to apex. Abdomen shining buff-brown dorsally, shining pale buff ventrally; last segment buff. Legs buff basally; metathoracic tibiae with a basal and a medial white streak, apex white; tarsi with a white annulation near base of first segment, apex of each segment pale gray.

Male genitalia: (Fig. 35) R.W.H. slide no. 482.

Female genitalia: (Fig. 96) R.W.H. slide no. 551.

Alar expanse: $7\frac{1}{2}$ –8 mm.

Food plant: *Desmodium* sp. Braun (1930) gives the following description of the larval habits: "The mine begins at the midrib, spreading outward and upward between two lateral veins in that part of the early mine adjacent to the lower of the lateral veins between which it lies, the parenchyma is left in narrow transverse bars, giving the mine a very characteristic aspect; as the mine increases, it extends beyond the confines of the two veins, with irregular projections and parenchyma all consumed. Pupa formed

with the mine beneath the transverse bars, which are here lined with silk forming a tubular pupal chamber."

Type: United States National Museum.

Type locality: Unknown. The type bears the following labels: 1) "1189." 2) "*Cosmopteryx* on *Lespedeza*, Boll." 3) "*Cosmopteryx lespedeza* Wlsm. Type." The specimen was in Riley's collection. It seems likely that the specimen came from Dallas, Texas the point of origin of much of the Boll material; however, this is not a certainty.

Specimens examined: 8 ♂, 7 ♀. ARKANSAS: Ozark National Forest, Stone Co., 1 ♂, 2 ♀, under rearing record B. 1643, emerged July 28, 1938 (Annette F. Braun), [AFB]. CONNECTICUT: East River, 1 ♂, July 31, 1908 (Chas. R. Ely). [USNM]. KENTUCKY: Cumberland Falls, 2 ♂, 1 ♀, under rearing record B. 1315, emerged July 12, 1932 (Annette F. Braun), [AFB, RWH]; Cumberland Valley, Letcher Co., 1 ♂, June 27, 1933 (Annette F. Braun), [AFB]; Mammoth Cave, 1 ♂, 1 ♀, under rearing record B. 1315, emerged September 9 and 11, 1941 (Annette F. Braun), [AFB]; Yahoo Creek, McCreary Co., 1 ♂, 1 ♀, under rearing record B. 1315, emerged July 5, 1935, collected June 18, 1935 (Annette F. Braun), [AFB]. OHIO: Beaver Pond, Adams Co., 1 ♀, under rearing record B. 1315, emerged August 15, 1927 (Annette F. Braun), [AFB]. SOUTH CAROLINA: Clemson College, 1 ♀, leaf miner on legume, emerged August 27, 1933 (W. C. Nettles), [USNM].

C. lespedezae can be distinguished from *C. attenuatella* by the apex of the antennae being white in *lespedezae*, brown in *attenuatella*. The markings place *lespedezae* closest to *C. abdita*; however, the characters in the keys to the male and female genitalia will suffice to separate the two species.

Apparently, Walsingham did not have complete notes on *lespedezae* when he synonymized it with *attenuatella* because the differences in the antennal markings and the maculation of the forewings are more than adequate to separate *lespedezae* as a discrete species. Even though the distribution records are not complete, *lespedezae* appears to have a more northern range than does *attenuatella*. By Walsingham's indicating that *attenuatella* equaled *lespedezae*, an error in the identity of *attenuatella* occurred. Busck (1906) gave the characters of the type of *lespedezae* for *attenuatella*, and this definition was followed by subsequent workers. Mr. Bradley has made it possible for me to identify *attenuatella* by furnishing me with a sketch of the male genitalia. The type of genitalia is so characteristic of this species that there can be no doubt as to its identity.

Cosmopterix opulenta Braun
(Figs. 37, 104, 148)

Cosmopteryx opulenta Braun, 1919. Ent. News, 30: 260. McDunnough, 1939. Mem. S. California Acad. Sci., 2: 63.

The description is quoted from Braun's paper (1919).

"Palpi white, outer and inner surfaces each marked with a black longitudinal line. Antennae grayish brown, becoming darker towards apex; with a conspicuous white line on anterior surface near base; last segment black, or sometimes merely black-tipped; next three preceding segments white; next three segments black; followed by a white, then a black, then a white segment [pecten present]. Head and thorax grayish brown, with three longitudinal white lines.

"Forewings brownish gray, or seal brown, with the basal half marked with five fine white longitudinal lines; one starting from base just within the costal edge diverges from the costa outwardly, extending about two-thirds through the basal brown area; a second extends along the extreme costa from the basal fourth almost or quite to the yellow fascia, becoming broader outwardly; a third along middle of wing from base to a little beyond the costo-basal streak; a fourth shorter streak below fold not attaining the base; a fifth white streak dorso-basal. Just beyond middle of wing, a yellow fascia. Four patches of metallic scales; the costal one of the inner pair limits the fascia inwardly, not touching the costa, and has a few black scales on its outer margin; dorsal patch placed farther back and with black scales on its inner margin; the yellow fascia extends between them and borders the inner side of the dorsal patch, sometimes almost to dorsal margin. Posterior pair of metallic patches almost opposite, attaining the margins, and limiting the yellow fascia outwardly, except in the middle of the wing where the fascia extends between and a little beyond them. Costal cilia immediately following the second costal metallic patch white; occasionally the yellow of the fascia is almost confluent with this white patch. Remainder of apical portion of wing and cilia of the basal brown ground color, except for a long white line extending from just beyond the yellow fascia to the tips of the apical cilia. Hind wings and cilia concolorous with fore wings. Legs gray streaked and banded with white. [Metathoracic tibiae with a longitudinal blue-white line extending from base to two-thirds or nearly to apex; this line moving from ventral surface to dorsal surface; apex blue-white.]

Male genitalia: (Fig. 37) R.W.H. slide no. 552.

Female genitalia: (Fig. 104) R.W.H. slide no. 539.

Alar expanse: $7\frac{1}{2}$ –9 mm.

Food plant: *Ambrosia psyllostachya* DC. Braun (1919) gives the following description of the larval mine: "The mines extend principally along the midrib, with irregular projections branching out on either side. The larva spins a cocoon on the densely pubescent under side of the leaf, constructed of silk, and the whitish pubescence of the leaf."

Type: Annette F. Braun Collection.

Type locality: Rivera, Los Angeles County, California.

Specimens examined: 10 ♂, 2 ♀. ARIZONA: Madera Canyon, 4,400 feet, Santa Rita Mountains, Pima Co., 1 ♂, October 12, 1959 (R. W. Hodges), [RWH]. CALIFORNIA: Rivera, Los Angeles Co., 2 ♂, 1 ♀, under rearing record B. 589, emerged April 17, 1910 (Annette F. Braun), [AFB]. OKLAHOMA: Oklahoma City, 8 ♂, July 27 through September 4 (D. R. Davis), [DRD, RWH].

C. opulenta can be separated from *C. quadrilineella* by the absence of lateral thoracic lines. The presence of a single signum in the female genitalia serves to separate it from the other species of *Cosmopterix*.

Specimens from Arizona and Oklahoma are decidedly darker brown than those from California. In part this may be a result of fading of the California specimens; however, when the description was made, the specimens were relatively fresh.

***Cosmopterix quadrilineella* Chambers**

(Figs. 38, 94, 149)

Cosmopterix quadrilineella Chambers, 1878. Bull. U. S. Geol. Surv. Terr., 4: 95. Dyar, 1902 [1903]. List of the Lepidoptera of North America, Bull. U. S. Natl. Mus., 52: 535. Busck, 1906. Proc. U. S. Natl. Mus., 30: 710. McDunnough, 1939. Mem. S. California Acad. Sci., 2: 63.

Tongue white to light buff. Labial palpi gray-brown; second segment with three white lines: one ventral, one on inner surface, and one on outer surface; third segment with an anterior and a posterior white line; apex white. Face buff ventrally becoming gray-brown dorsally; vertex gray-brown with three white lines, one over each eye and one medial. Antennae brown; pecten present; ventral surface of scape white; an anterior white line continued on shaft to one-half; apical two segments brown, pre-

ceeded by two white, five brown, one white, four brown, one white, then brown segments. Thorax brown with continuation of three white lines on vertex. Forewings with basal third and apical area dark gray-brown; four white lines in basal area; a yellow fascia from one-third to two-thirds with a medial extension to three-fourths; four silver patches in fascia; outer costal silver patch followed by a white streak in cilia; a white line from end of fascia to apex; cilia gray-brown. Hindwings fuscous. Abdomen brown with purple reflections dorsally, becoming ochreous ventrally. Legs brown; prothoracic legs with a white line from femur to apex of tarsus; tibiae with three oblique stripes; basal, medial, and apical; tarsi brown with a dorsal white line; metathoracic tibiae with a basal and a medial oblique white line; apex and spurs white; tarsi with a dorsal white line.

Male genitalia: (Fig. 38) R.W.H. slide no. 544.

Female genitalia: (Fig. 94) R.W.H. slide no. 848.

Alar expanse: 7-9 mm.

Food plant: unknown.

Type: Museum of Comparative Zoology.

Type locality: Bosque Co., Texas.

Specimens examined: 11 ♂, 21 ♀. ARIZONA: Madera Canyon, 4,880 and 5,600 feet, Santa Rita Mountains, Santa Cruz Co., 10 ♂, 20 ♀, July 10 through September 24, 1959 (R. W. Hodges), [CU, RWH]; same date except, Pima Co., 4,400 feet, 1 ♂, 1 ♀, October 10 and 26, 1959 [RWH].

C. quadrilineella can be separated from the other species of *Cosmopterix* by the fascia surrounding both of the basal silver spots.

***Cosmopterix minutella* Beutenmueller**

(Figs. 31, 150)

Cosmopterix minutella Beutenmueller, 1889. Ent. Americana, 5: 10. Dyar, 1902 [1903]. List of the Lepidoptera of North America, Bull. U. S. Natl. Mus., 52: 535. Busck, 1906. Proc. U. S. Natl. Mus., 30: 711. McDunnough, 1939. Mem. S. California Acad. Sci., 2: 63.

Tongue shining pale buff-yellow. Labial palpi white, a dorsal brown line on second segment, an internal and an external brown line on third segment. Antennae olive-brown; pecten present; scape with ventral surface and an anterior line white; anterior line continued on shaft to one-third or one-half; apical four segments white, preceded by three brown, one white, one brown, one

white, and one brown segment. Face shining gray-brown; vertex olive-brown with three white lines, one above each eye and one medial. Thorax olive-brown with continuation of three white lines. Forewings with basal area olive-brown and with four white lines; fascia pale yellow, bordered by four silver spots; apical area buff-gray with a white line along dorsal margin. Hindwings pale fuscous. Abdomen ochreous dorsally, shining buff ventrally. Legs shining buff basally; metathoracic tibiae olive-brown with three white lines: one from base to one-third, one from base to three-fourths, and one from two-thirds to near apex; metathoracic tarsi with a brown annulation basally followed by a broad white annulation, then buff-brown and buff; segments two through five brown ventrally, buff dorsally.

Male genitalia: (Fig. 31) R.W.H. slide no. 893.

Female genitalia: no specimens available.

Alar expanse: 7-8 mm.

Food plant: unknown.

Type: United States National Museum.

Type locality: Central Florida.

Specimens examined: 6 ♂. FLORIDA: Archbold Biological Station, Highlands Co., 1 ♂, March 29, 1959 (R. W. Hodges), [RWH]; Everglades, 1 ♂, April 8-15 [USNM]; Homestead, 3 ♂, May 1 and November 2, 1959 (D. O. Wolfenbarger), [CPK]; Lakeland, 1 ♂, March 1913 (C. N. Ainslie), [USNM].

The costomedial line extending from the base of the forewing in *C. minutella* separates it from *C. attenuatella* and *C. damnosa* which have this line starting beyond the base of the wing. The shape of the left brachium in the male genitalia (Fig. 31) serves to distinguish *minutella* from the other North American species of *Cosmopterix*.

***Cosmopterix abdita*, new species**

(Figs. 36, 151)

Tongue shining yellow-white. Labial palpi dark olive-brown; second segment with three white lines: one ventral, one on inner surface, and one on outer surface; third segment with a dorsal and a ventral white line; apex white. Antennae with pecten present; dark olive-brown; ventral surface of scape white; an anterior white line on scape continued on shaft as a series of dots to two-thirds; apical five segments white, preceded by five brown, one white, one brown, one white, then brown segments (in some specimens segments one through four, ten, and twelve white). Face

shining brassy-white, vertex olive-brown, caudal margin dark olive-brown, a white line above each eye and a medial one. Thorax olive-brown with continuation of three white lines on vertex. Forewings dark olive-brown basally and distally; four silver-blue lines in basal area; an orange-brown or brown fascia at two-thirds, bounded by silver-blue fasciae; a white costal patch beyond orange-brown fascia; apex white; cilia concolorous with basal area of wing, becoming paler dorsally. Hindwings fuscous-brown, cilia slightly paler. Abdomen brown dorsally, becoming straw colored ventrally. Legs buff basally; metathoracic tibiae with a white annulation at middle and another at apex, a white line from base to one-fourth; apices of first three tarsal segments white, last two segments white; prothoracic legs with a dorsal white line on tibiae and tarsi.

Male genitalia: (Fig. 36) R.W.H. slide no. 405.

Female genitalia: no specimens available.

Alar expanse: 7-8 mm.

Food plant: unknown.

HOLOTYPE: ♂, Archbold Biological Station, Lake Placid, Highlands Co., FLORIDA, April 1, 1959 (R. W. Hodges), [CU Type No. 3794].

PARATYPES: same data as type, 5 ♂, March 27 through April 4 [RWH]; Homestead, FLORIDA, 3 ♂, September 23, 1958, February 8, 1959, and April 24, 1959 (D. O. Wolfenbarger), [CPK]; C[olumbia], MISSOURI, 1 ♂, no date or collector [AMNH]; Kirkwood, Missouri, 2 ♂, September 2 and 30, 1899 (Murtfeldt), [CU].

Other specimens examined: Everglades, FLORIDA, 2 ♂, 8-15 IV [USNM]; N. ILL[INOIS], 1 ♀, no date or collector [USNM].

Cosmopterix abdita can be distinguished from the other species of *Cosmopterix* by the left brachium being offset in the middle of the sclerotized area in the male genitalia. This species is close to *C. lespedezae* in maculation, and in questionable cases reference should be made to the genitalia.

***Cosmopterix inopis*, new species**

(Figs. 39, 103, 152)

Tongue shining buff. Labial palpi dark olive-brown; second segment with three white lines: one ventral, one internal, and one external; third segment with a ventral and a dorsal white line; apex white. Antennae dark olive-brown; pecten present; scape with ventral surface white and with an anterior white line continued on shaft to one-half; apical four segments white, preceded

by five brown, one white, one brown, one- and one-half white, then brown segments. Face buff-brown with purple reflections; vertex olive-brown with three white lines, one above each eye and one medial. Thorax dark olive-brown with continuation of three white lines on vertex and with a blue-white line on outer margin of patagia. Forewings basally and apically dark olive-brown; four blue-white lines in basal area; a bright yellow fascia bordered basally by a silver fascia and apically by two silver-purple spots; a white streak in costal cilia beyond fascia; a blue-white line from end of yellow fascia to apex of cilia; a yellow line extending along costa basally from fascia. Hindwings fuscous. Abdomen pale gray-yellow dorsally, buff ventrally. Legs buff basally, dark olive-brown distally; metathoracic tibiae with a blue-white streak from base to one-fourth, another from one-half to three-fourths, apex blue-white; outer surface of outer tibial spurs blue-white; tarsi shining pale buff-gray.

Male genitalia: (Fig. 39) R.W.H. slide no. 540.

Female genitalia: (Fig. 103) R.W.H. slide no. 996.

Alar expanse: 7-8 mm.

Food plant: unknown.

HOLOTYPE: ♂, Madera Canyon, 4,880 feet, Santa Rita Mountains, Santa Cruz Co., ARIZONA, September 23, 1959 (R. W. Hodges), [CU Type No. 3799].

PARATYPE: same locality as type, 1 ♂, September 2, 1959 [RWH].

Other specimens examined: Homestead, FLORIDA, 1 ♀, April 10, 1959 (D. O. Wolfenbarger), [CPK].

C. inopis can be distinguished from the other species of *Cosmopterix* by the quadrate distal portion of the valvae in the male genitalia.

***Cosmopterix chalybaeella* Walsingham**

Cosmopterix chalybaeella Walsingham, 1889. Ins. Life, 1: 289. Dyar, 1902 [1903]. List of the Lepidoptera of North America, Bull. U. S. Natl. Mus., 52: 534. Busck, 1906. Proc. U. S. Natl. Mus., 30: 711. McDunnough, 1939. Mem. S. California Acad. Sci., 2: 63.

C. chalybaeella is known only from the type which is in the British Museum (Natural History). I quote Walsingham's original description because no specimens are available.

"Antennae, brown, a white line along the side of the basal joint and running approximately through half their length; apex white, with two or more white rings, preceded by a dark band before it.

"Palpi, whitish, with a slender line of brown scales extending along the outer side of the apical joint.

"Head, brown, with central and lateral slender white lines running back over the thorax, which is also brown; face whitish.

"Fore-wings, brown, with two short rather broad silvery dashes at about one-fourth from the base, the first nearest the costa, commencing also nearest to the base; a very slender silvery line from the base along the dorsal margin; and a short oblique streak of the same color tending downwards from the costal margin towards the apex of the upper dash; beyond the basal half of the wing is the usual orange-yellow space, limited internally and externally by shining steel-gray metallic spots, the pair adjacent to the costa being much wider apart than the opposite pair, which are adjacent to the dorsal margin; there is a white streak in the costal cilia touching the upper and outer metallic spot, and a similar apical streak is continued a very short distance along the dorsal margin; cilia steel-gray, with a slight greenish tinge.

"Hind-wings and cilia, the same color.

"Legs, brownish; tarsal joints smeared and spotted with white.

"Exp. al., 6 mm.

"Habitat, Southwest Texas (Morrison).

"Type male, Mus. Wlsm."

According to Walsingham's description of the habitus of *chalybaeella*, it would key to the last couplets which include *C. inopis*, *C. lespedezae*, *C. gracilens*, and *C. abdita*.

Mr. Bradley (*in litt.*) states that the abdomen of the type is missing. He has compared some specimens which I thought might be *chalybaeella* with the type; however, in each instance the specimen was of another species.

***Cosmopterix gemmiferella* Clemens**

(Figs. 41, 107, 153)

Cosmopterix gemmiferella Clemens, 1860. Proc. Acad. Nat. Sci. Philadelphia, 10. Frey and Boll. 1876. Stettiner Ent. Zeit., 37: 214. Busck, 1903. Proc. Ent. Soc. Washington, 5: 197. Dyar, 1902 [1903]. List of the Lepidoptera of North America, Bull. U. S. Natl. Mus., 52: 535. Busck, 1906. Proc. U. S. Natl. Mus., 30: 709. Forbes, 1923. Lepidoptera of New York and neighboring states, Cornell Univ. Agric. Exp. Sta. Mem.,

68:332. Braun, 1923. Trans. American Ent. Soc., 49:115.
McDunnough, 1939. Mem. S. California Acad. Sci., 2:63.

Tongue gray-brown. Labial palpi brown; a white line on inner surface of second segment, another on outer surface; a white line on anterior surface of third segment, another on posterior surface. Antennae brown; pecten present; scape with an anterior white line continued to middle of shaft as a series of dots; apical four segments white, preceded by five brown, four white, then by brown segments (series possibly three white, five brown, three white or three white, five brown, one white, one brown, and two white.) Face silver-gray with bluish highlights; vertex brown with three silver-blue lines, one above each eye and one medial. Thorax brown with continuation of medial line, lateral lines not present. Forewings brown on basal half and apical fourth; four silver-blue lines in basal area; a transverse silver fascia at one-half followed by an orange fascia (with age orange fading to pale yellow-brown); a silver patch at end of orange fascia from dorsal margin to middle of wing; another smaller silver patch more distad from middle of wing towards costa, white on costa at this point; a row of brown scales preceding outer silver patches; a silver-blue streak at tornal area; apex white; cilia concolorous with base of wing. Hindwings fuscous-brown. Abdomen brown dorsally, silver ventrally. Legs metallic bluish-brown on coxae, trochanters, and femora; tibiae and tarsi brown; metathoracic tibiae with a short white line on dorsal surface from base; a white annulation at middle of tibia; outer dorsal surface of tibial spurs white; apices of first, second, and fourth tarsal segments white; fifth tarsal segment white.

Male genitalia: (Fig. 41) A. Busck slide.

Female genitalia: (Fig. 107) R.W.H. slide no. 947.

Alar expanse: 9-12 mm.

Food plant: *Panicum dichotomum* L. According to Braun (1923) the habits of the larva are: "The larva mines the small basal leaves of *Panicum dichotomum* L., in the spring, eating out almost the entire substance of the leaf. Just before pupation, it enters one of the lower stem leaves, in which it makes a small inconspicuous mine, scarcely larger than the larva, but broadening at its anterior end toward the tip of the leaf, slightly inflated, and showing as a convexity on the upper surface of the leaf. Within this cavity, which is silk-lined, pupation takes place. Beyond the pupation chamber, the mine extends a short distance forwards, but is scarcely visible except at its end, where the epidermis is almost eaten through, permitting the emergence of the imago."

The statement in Forbes (1923) that the foodplant is *Ipomoea* is possibly based upon an earlier hypothesis of Busek; however, the larva of *C. gemmiferella* has never been recorded from *Ipomoea*.

Type: Academy of Natural Sciences, Philadelphia.

Type locality: Philadelphia.

Specimens examined: 25 ♂, 7 ♀. FLORIDA: Boulogne, U. S. Route 1 and St. Marys River, 1 ♂, April 1, 1936 (J. G. Franclemont), [CU]. ILLINOIS: Putnam Co., 1 ♀, June 30, 1940 (M. O. Glenn), [MOG]. KENTUCKY: Pine Knot, McCreary Co., 1 ♂, June 14, 1935 (Annette F. Braun), [RWH]; Pine Mt., Letcher Co., 1 ♂, June 21, 1933 (Annette F. Braun), [AFB]. MAINE: Augusta, 3 ♂, July 6 and 16 (A. E. Brower), [AEB]; Bar Harbor, 1 ♂, (A. E. Brower), [AEB]; Lincoln, 1 ♀, July 10 (A. E. Brower), [AEB]. MASSACHUSETTS: Boston, 1 ♂ [USNM]. NEW JERSEY: Essex Co. Park, 4 ♂, 1 ♀, June 7 through July 4 (W. D. Kearfott), [USNM, MCZ]. NEW YORK: East Aurora, 1 ♀, July 30, 1917 (W. Wild), [CU]. OHIO: Beaver Pond, Adams Co., 1 ♂, under rearing record B. 1079, emerged June 3, 1931 (Annette F. Braun), [AFB]; Cincinnati, 1 ♂, July 3, 1917 (Annette F. Braun), [AFB]; Clermont Co., 2 ♀, under rearing record B. 1079, emerged May 24 and 26, 1922 (Annette F. Braun), [AFB, USNM]; Mineral Springs, Adams Co., 1 ♂, June 27, 1931 (Annette F. Braun), [AFB]. PENNSYLVANIA: New Brighton, 2 ♂, July 12 and 17, 1907 [USNM]; Hazelton, 4 ♂, 1 ♀, July 2-27 (Dietz), [MCZ]; Oak Station, Allegheny Co., 1 ♂, June 23, 1913 (Fred Marloff), [CNHM]. VIRGINIA: Falls Church, 1 ♀, June 2 (A. Busek), [USNM]. QUEBEC: Knowlton, 1 ♂ (L. J. Milne), [CNC].

C. gemmiferella can be distinguished from *C. bacata* by the antennal markings; the former has a brown annulation interrupting the white area.

***Cosmopterix bacata*, new species**

(Figs. 42, 154)

Tongue buff-brown. Labial palpi: second segment gold-buff dorsally, olive-brown ventrally; third segment olive-brown with an anterior and a posterior blue-white line. Antennae with pecten present; olive brown; scape with ventral surface and an anterior line white; apical eight segments of shaft white, preceding segments olive-brown. Face shining golden; vertex olive-brown with three blue-white lines, one above each eye and one medial. Thorax olive-brown with continuation of medial blue-white line of vertex

Forewings olive-brown basally and apically; four silver-blue lines in basal area; a transverse silver fascia at one-half followed by a broad orange fascia; a silver spot at end of orange fascia from dorsal margin to middle of wing; another, smaller silver patch more distad from middle of wing towards costa; white on costa at this point; a row of brown scales preceding outer silver spots; a silver-blue streak at tornal area; apex white; cilia concolorous with base of wing. Hindwings fuscous-brown. Abdomen brown dorsally, silver ventrally. Legs metallic bluish-bronze on coxae, trochanters, and femora; tibiae and tarsi brown; metathoracic tibiae with a short white line on dorsal surface from base; a white annulation at middle of tibiae; outer dorsal surface of tibial spurs white; apices of first, second, and fourth tarsal segments white; fifth tarsal segment white.

Male genitalia: (Fig. 42) R.W.H. slide no. 406.

Female genitalia: Unknown.

Alar expanse: 9-10 mm.

Food plant: Unknown.

HOLOTYPE: ♂, Leroy, ALABAMA, June 11, 1917 (J. C. Bradley), [CU Type No. 3816].

PARATYPE: Winter Park, FLORIDA, 1 ♂, May 1946 (A.B. Klotz), [ABK].

C. bacata can be separated from *C. gemmiferella* by the apical eight segments of the antennae being white; in *gemmiferella* the apical three segments are white, preceded by five brown segments.

***Cosmopterox damnosa*, new species**

(Figs. 43, 155)

Tongue shining pale buff. Labial palpi olive-brown; second segment with three white lines: one internal, one external, and one ventral; third segment with an anterior and a posterior white line. Antennae dark olive-brown; pecten present; scape with an anterior white line, ventral surface white; shaft with white ventral surface to one-half and an anterior white line to two-thirds; apical three segments brown, preceded by two white, five brown, one white, one brown, one white, then brown segments. Face shining buff-brown; vertex olive-brown with three silver-blue lines, one above each eye and one medial. Thorax olive-brown with five blue-white lines, one on outer margins of patagia, one on inner margins of patagia, and one medial. Forewings with basal and apical areas dark olive-brown; four silver-blue lines on basal half; a pale yellow fascia at one-half bordered basally by two silver spots and apically by two

silver spots; a white streak in costal cilia beyond fascia; a white line from fascia to apex. Abdomen shining buff-brown dorsally, shining pale buff ventrally; last segment buff. Legs buff basally; metathoracic tibiae with a basal and a medial white streak, apex of each segment pale gray.

Male genitalia: (Fig. 43) R.W.H. slide no. 896.

Female genitalia: No specimens available.

Alar expanse: 7 mm.

Food plant: Unknown.

HOLOTYPE: ♂, Archbold Biological Station, Highlands Co., FLORIDA, March 27, 1959 (R. W. Hodges), [CU Type No. 3796].

This species can be distinguished from *C. lespedezae* by the apex of the antennae being brown in *damnosa*, white in *lespedezae*. It can be separated from *C. attenuatella* by the globose aedeagus.

Cosmopterix clemensella Stainton

(Figs. 40, 99, 156)

Cosmopterix clemensella Stainton, 1860. Ent. Week. Int., 9:31.

Dyar, 1902 [1903]. List of the Lepidoptera of North America, Bull. U. S. Natl. Mus., 52:535. Busck, 1906. Proc. U. S. Natl. Mus., 30:9. Forbes, 1923. Lepidoptera of New York and neighboring states, Cornell Univ. Agric. Exp. Sta. Mem., 68:332. McDunnough, 1939. Mem. S. California Acad. Sci., 2:63.

Cosmopterix hermodora Meyrick, 1919. Exot. Micr., 2:282. **new synonymy.** Forbes, 1923. Lepidoptera of New York and neighboring states, Cornell Univ. Agric. Exp. Sta. Mem., 68:332. McDunnough, 1939. Mem. S. California Acad. Sci., 2:63.

Tongue buff-white. Labial palpi dark olive-brown; second segment with three white lines: one ventral, one on inner surface and one on outer surface; third segment with an anterior and a posterior white line. Antennae with pecten present; scape with ventral surface and an anterior line white; white line continued on shaft to three-fifths, in some specimens to inner white band; apical four segments white, preceded by five brown (or one white, one brown, two white), four white, then brown segments. Face shining buff-white; vertex olive-brown with three white lines, one medial and one above each eye. Thorax dark olive-brown with continuation of three lines on vertex. Forewings dark olive-brown basally and apically; four blue-white lines on basal half; a yellow-orange fascia at one-half, bordered inwardly by a silver band not reaching costal margin; outwardly, fascia bordered by a dorsal and a costal

silver patch; fascia extending between outer silver spots; a white streak in costal cilia above outer costal spot; a blue-white line along dorsal margin of wing from end of fascia to apex of cilia; cilia concolorous with base of wing. Hindwings fuscous brown. Abdomen pale yellowish or yellow-brown dorsally, silver ventrally. Legs metallic silver-yellow basally, brown distally; metathoracic tibiae with blue-white at base, middle, and apex; tibial spurs blue-white with a ventral brown line; metathoracic tarsi brown basally, silver-blue distally; each segment tipped with silver-blue; a dorsal silver-blue line on segments one, two, three, and five.

Male genitalia: (Fig. 40) R.W.H. slide no. 556.

Female genitalia: (Fig. 99) R.W.H. slide no. 555.

Alar expanse: $6\frac{1}{2}$ –9 mm.

Food plant: *Carex* spp.

Type: *clemensella*, British Museum (Natural History); *hermodora*, British Museum (Natural History).

Type locality: *clemensella*, Pennsylvania (?); *hermodora*, Toronto, Canada.

Specimens examined: 39 ♂, 29 ♀. ILLINOIS: Putnam Co., 5 ♂, 1 ♀, June 16 through July 31 (M. O. Glenn), [MOG, INHS]. INDIANA: Spring Mill State Park, 3 ♂, 2 ♀, under rearing record B. 1934, emerged May 13–23, 1942 (Annette F. Braun), [AFB]. MAINE: Bar Harbor, 1 ♀, August 3, 1936 (A. E. Brower), [AEB]. MARYLAND: Plummer's Id., 1 ♀, May 30, 1916 (A. Busck), [USNM]; same locality, 1 ♂, June 23, 1920 (H. Barber), [USNM]. NEW HAMPSHIRE: no locality or date (A. Busck), [USNM]. NEW JERSEY: Essex Co. Park, 1 ♂, June 30 (Kearfott), [USNM]. NEW YORK: Blue Mt., Adirondacks, 1 ♂, 1 ♀, under rearing record B. 2105, emerged July 10, 1946 (Annette F. Braun), [AFB]; Ithaca, Tompkins Co., 1 ♂, July 12, 1928 (A. B. Klots), [ABK]; Slaterville Springs, Tompkins Co., 2 ♂, July 6, 1960 (R. W. Hodges), [RWH]; Wanakena, 1 ♂, under rearing record B. 2104, emerged July 1946 (Annette F. Braun), [AFB]; same locality, 1 ♂, 1 ♀, under rearing record B. 2103, emerged June 30 and July, 1946 (Annette F. Braun), [AFB]; Woodlands, 1 ♂, July 4, 1934 (A. B. Klots), [ABK]. NORTH CAROLINA: Nantahala Gorge, 2 ♂, 2 ♀, under rearing record B. 1706, emerged June 1–9, 1939 (Annette F. Braun), [AFB]. OHIO: Beaver Pond, Adams Co., 1 ♀, on *Carex*, emerged March 20, 1938 (Annette F. Braun), [AFB]; Cincinnati, 4 ♂, 10 ♀, June 21 through July 1 (Annette F. Braun), [AFB, USNM, RWH]; Cincinnati, 1 ♂, 2 ♀, under rearing record B. 999, emerged May 15–26 (Annette F. Braun), [AFB]; Clermont Co., 2 ♂, June 6, 1919 (Annette F. Braun), [CAS, RWH]; Clermont Co., 2 ♀, under rearing record B. 999, emerged May 14 and 17, 1929 (An-

nette F. Braun), [AFB]; Mineral Springs, Adams Co., 1 ♀, under rearing record B. 999, emerged June 3, 1931 (Annette F. Braun), [AFB]. PENNSYLVANIA: New Brighton, 5 ♂, June 20 through July 9 (H. D. Merriek), [USNM]; Harvey's Lake, 1 ♀, June 16 [USNM]. VERMONT: Sherburne Pass, 1 ♀, under rearing record B. 2108, emerged July 11, 1946 (Annette F. Braun), [AFB]. MANITOBA: Aweme, 1 ♂, July 9, 1924 (N. Criddle), [CNC]. ONTARIO: Toronto, 1 ♂, July 1922 (Parish), [USNM]; Toronto, 2 ♀, "7.16" and "5.7 16" (Parish), [BMNH].

C. clemensella can be separated from the other species of *Cosmopterix* by the characters given in the key based on maculation. The male genitalia of *C. damnosa* are not separable from some of *clemensella*. In this situation the two keys should be used in conjunction.

I have examined the female syntypes of *hermodora* and have seen a photograph of the lectotype male (selected by Clarke and to be published in the near future). The maculation and the genitalia fall within the range of variation observed in *clemensella*; thus, I consider *hermodora* a synonym of *clemensella*.

There is considerable variation in the shape of the distal half of the left brachium in the male genitalia. In some specimens it is broad almost to the apex; then it tapers abruptly to the apex. In other specimens this same structure begins to taper at the middle or outer third with the result that the apex is acute. In the female genitalia the *lamella antevaginalis* can be relatively broad, or, it can be narrow with an abrupt constriction at the basal third. Also, the length of the *apophyses anteriores* is between one and two times the length of the sclerotized portion of the eighth tergite. Males and females exhibiting the maximum amount of difference have been reared from *Carex*, and they make the same type of mine. Thus, I have concluded that *clemensella* is a single, variable species.

Cosmopterix scirpicola, new species

(Figs. 44, 105, 157)

Tongue shining buff-yellow. Labial palpi pale buff; a dorsal and a ventral olive-brown line on second segment; an internal and an external olive-brown line on third segment; apex white or olive-brown. Antennae with pecten present; olive-brown; scape white ventrally and with an anterior white line; shaft white ventrally to one-half, continuation of anterior white line to one-fourth; apical nine segments olive-brown, preceded by one white, then brown segments (or apical three brown, one white, five brown, one white,

then brown). Face shining pale yellow becoming olive-brown dorsally; vertex olive-brown with three white lines, one above each eye and one medial. Thorax olive-brown with continuation of three white lines on vertex. Forewings: pattern and coloration as for *C. ebriola*; color slightly darker than that of *ebriola*. Hindwings fuscous. Legs shining buff basally, olive-brown distally; meta-thoracic tibiae with three oblique white stripes: one basal, one medial, and one apical; apices of tarsal segments one, two, four, and five buff.

Male genitalia: (Fig. 44) R.W.H. slide no. 478.

Female genitalia: (Fig. 105) R.W.H. slide no. 856.

Alar expanse: 10–11 mm.

Food plant: *Scirpus americanus*.

HOLOTYPE: ♂, Oklahoma City, OKLAHOMA, August 13, 1956 (D. R. Davis), [USNM Type No. 66080].

PARATYPES: same locality as type, 1 ♂, 2 ♀, July 16 through August 6 [DRD, RWH]; Archbold Biological Station, Highlands Co., FLORIDA, 1 ♂, March 27, 1959 (R. W. Hodges), [RWH]; Cedar Swamp, Champaign Co., OHIO, 1 ♂, on *Scirpus americanus*, emerged May 1934 (Annette F. Braun), [AFB]; Chicago, ILLINOIS, 1 ♀, June 30, 1909 (W. J. Gerhard), [CNHM]; Putnam Co., ILLINOIS, 1 ♀, June 8, 1954 (M. O. Glenn), [MOG]; Pautexaut (*sic*) [Patuxent] Research Refuge, Prince George Co., MARYLAND, *ex* culms of *Scirpus americanus*, emerged July 22, 1942 [USNM]; Putnam Co., Illinois, 1 ♀, June 8, 1954 (M.O.) Glenn, [MOG]; Sabine R. Ferry, opp. Orange, LOUISIANA, 1 ♂, June 20, 1917 [CU]; San Diego, CALIFORNIA, 1 ♂, August 29, 1923 [LACM].

C. scirpicola can be separated from *C. ebriola* and *C. fernaldella* by the dorsal surface of the left brachium tapering gradually to the apex (see Figs. 44, 45, 46 for comparison). The best point of separation is the comparative length of the *apophyses anteriores* in the female genitalia. In *scirpicola* the *apophyses anteriores* are longer than the *lamella antevaginalis*; they are shorter than the *lamella antevaginalis* in *ebriola* and *fernaldella*. The maculation offers no constant features for separating this species from *ebriola* and *fernaldella*.

Cosmopterix ebriola, new species

(Figs. 46, 100, 158)

Tongue shining buff. Labial palpi light buff to white; second segment with a ventral brown line, continued on inner surface of third segment; a brown line on outer surface of third segment;

apex of third segment white; a pale brown line on dorsal surface of second segment. Antennae with pecten present; brown; scape with ventral surface buff; an anterior white line continued on shaft to one-half; ventral surface of shaft white basally; apical nine segments brown, preceded by one buff, one brown, one buff, then brown segments (in a few specimens fourth segment buff instead of brown). Face shining ocher becoming darker and browner toward vertex; vertex brown with three white lines, one above each eye and one medial. Thorax buffy-olive with continuation of three lines on vertex. Forewings with basal half and outer third dark olive-buff; four white lines in basal area; an ochraceous-buff fascia from one-half to two-thirds, bordered inwardly by two silver spots—one dorsally and one costally; costal spot preceded by a row of darker scales and followed by a few black scales; fascia extending basad along costal margin to one-fourth, becoming paler; outwardly, fascia bordered by two silver spots, one dorsal and one costal; fascia extending apically between spots and along costal margin; a white line along dorsal margin of wing from end of fascia to apex of cilia; cilia fuscous brown. Hindwings fuscous-buff basally, brown distally; prothoracic tibiae and tarsi with a continuous dorsal white line; metathoracic tibiae with a dorsal white line from base to one-third; a second white line from base along ventral surface to one-half then moving dorsal to three-fourths; apex white; inner surface of tarsi white.

Male genitalia: (Fig. 46). R.W.H. slide no. 475.

Female genitalia: (Fig. 100). R.W.H. slide no. 851.

Alar expanse: 8–11 mm.

Food plant: unknown.

HOLOTYPE: ♀, Archbold Biological Station, Highlands Co., FLORIDA, March 30, 1959 (R. W. Hodges), [CU Type No. 3798].

PARATYPES: same locality as type, 12 ♂, 9 ♀, March 27 through April 4, 1959 [CU, USNM, BMNH, RWH]; Gainesville, FLORIDA, 1 ♀, July 8, 1927 (J. S. Rogers), [CU]; Hastings, Florida, 1 ♂, 1 ♀, "19C and 19a" [MCZ]; Punta Gorda, Florida, 2 ♂, 2 ♀, March 1940 (H. Ramstadt), [MOG]; Siesta Key, Sarasota Co., Florida, 1 ♂, May 1, 1960 (C. P. Kimball), [CPK]; Biloxi, MISSISSIPPI, 2 ♂, June 13, 1917 [CU].

Other specimens examined: Hastings, FLORIDA, 1 ♂, "19a" [MCZ]; Lakeland, Florida, 1 ♀, March 13 (C. N. Ainslie), [USNM]; Siesta Key, Sarasota Co., Florida, 2 ♀, April 26 and 29 (C. P. Kimball), [CPK, RWH].

Two females with the same type of genitalia as *ebriola* have the fascia almost concolorous with the basal area of the wing; there are more black scales distad of the silver spot; the silver

spots are fused; the hindwings are darker; the median line on the vertex and thorax is absent; and the specimens are in general slightly melanic. However, these specimens fall within the range of variation of *ebriola* and do not appear to represent another species.

C. ebriola cannot be separated with confidence from *C. fernaldella* and *C. scirpicola* by the maculation. The female genitalia will serve to distinguish among them as follows: *ebriola* has sub-circular signa and the *apophyses anteriores* shorter than the *lamella antevaginalis*. The latter character will separate it from *scirpicola*; the former character will separate it from *fernaldella*.

Cosmopterix fernaldella Walsingham
(Figs. 45, 97, 98, 159)

Cosmopterix fernaldella Walsingham, 1882. Trans. American Ent. Soc., 10: 197. Dyar, 1902 [1903]. List of the Lepidoptera of North America, Bull. U. S. Natl. Mus., 52: 535. Busck, 1906. Proc. U. S. Natl. Mus., 30: 711. Forbes, 1923. Lepidoptera of New York and neighboring states, Cornell Univ. Agric. Exp. Sta. Mem., 68: 332. McDunnough, 1939. Mem. S. California Acad. Sci., 2: 63.

Tongue shining buff. Labial palpi pale buff; second segment with three brown lines: a faint dorsal one, one on inner ventral surface, and one on outer ventral surface; third segment with two brown lines, one inner surface and one on outer surface; apex white. Antennae with pecten present; brown; scape with ventral surface buff and an anterior buff line; anterior line continued to one-third; apical three segments brown, preceded by one buff, five brown, one buff, two brown, one buff, then brown segments (five brown, one buff, one brown in a few specimens). Face shining buff; vertex gray-brown with three white lines, one above each eye and one medial. Thorax gray-brown with continuation of three white lines. Forewings gray-brown basally and apically; four blue-white lines in basal area: one costal, two medial, and one dorsal; a pale yellow, orange, or orange-brown fascia at two-thirds bordered inwardly by two silver spots preceded by a few brown scales; a patch of black scales on outer margin of costal silver spot; outwardly, fascia bordered by two silver spots preceded by a few black scales; fascia sometimes extending distally between outer silver spots; a buff to white patch of scales in costal margin above outer silver spot;

a white line extending from middle of outer margin to apex; cilia concolorous with basal area. Hindwings light fuscous. Abdomen gray-brown dorsally, buff ventrally. Legs buff; metathoracic tibiae with three annulations: one basal, one medial, and one terminal; apices of tarsal segments whitish.

Male genitalia: (Fig. 45). R.W.H. slide no. 490.

Female genitalia: (Figs. 97, 98) R.W.H. slide nos. 854 and 883.

Alar expanse: 9–11 mm.

Food plant: *Carex* sp.

Type: United States National Museum.

Type locality: unknown.

Specimens examined: 34 ♂, 28 ♀. MAINE: Ashland, 1 ♂, 2 ♀, July 16, 31 (A. E. Brower), [AEB, RWH]; Augusta, 1 ♂, July 21, 1948 (A. E. Brower), [AEB]; Dennysville, 2 ♂, July 19 (A. E. Brower), [AEB]; Lincoln, 1 ♂, July 13 (A. E. Brower), [AEB]; Millinocket, 2 ♀, July 22 (A. E. Brower), [AEB]; Princeton, 1 ♂, 5 ♀, July 9–24, 1943 (A. E. Brower), [AEB]; T. 6, R. 7 (Patten), 1 ♂, 3 ♀, July 16–21 (A. E. Brower), [AEB]. MARYLAND: Washington, D. C., 1 ♀, May 1902 (A. Busek), [USNM]. MICHIGAN: Dickinson Co., 4 ♂, July 21–25, 1909 (W. W. Newcomb), [UM]; Black Lake, Presque Isle Co., 2 ♂, 1 ♀, leafminer on *Carex stricta*, emerged July 8 and 15, 1936 (Annette F. Braun), [USNM]; Burt Lake, Reese's Bog, Cheboygan Co., 11 ♂, 3 ♀, under rearing record B. 1975, emerged July 24, 1942 (Annette F. Braun), [AFB]; Gull Lake Biological Station, Kalamazoo Co., 1 ♂, 1 ♀, July 3 and 6, 1956 (R. W. Hodges), [MSU]. NEW JERSEY: Montclair, 2 ♂, 2 ♀, June 28 and July 1 (W. D. Kearfott), [USNM, MCZ]. NEW YORK: Ithaca, 1 ♂, July 17, 1931 [ABK]; Monroe Co., 3 ♂, 5 ♀, June 3 through July 11 (C. P. Kimball), [CPK]; The Shack, McLean Bogs Reserve, Tompkins Co., 2 ♂, 1 ♀, July 24, 1924 [CU]. PENNSYLVANIA: Hazelton, 1 ♂, 1 ♀, July 7 and 8, 1897 (Dietz), [MCZ]. ONTARIO: Ottawa, 1 ♂, 2 ♀, July 11–23 (C. H. Young), [CNC].

C. fernaldella cannot be consistently separated from *C. ebriola* and *C. scirpicola* by the maculation. The male and female genital characters given in the keys will separate them. Females from the central New York area differ from other populations in the nature of the posterior edge of the seventh abdominal sternite. This is not produced as much in the medial area as it is in specimens from other areas, but it seems to me that this is within the variation of the species rather than another species. The male genitalia of this population agree very closely with those from other areas.

Cosmopterix floridanella Beutenmueller
(Figs. 47, 102, 160)

Cosmopterix floridanella Beutenmuller, 1889. Ent. Americana, 5: 10. Busck, 1902. Jour. New York Ent. Soc., 10: 98. Dyar, 1902 [1903]. List of the Lepidoptera of North America, Bull. U. S. Natl. Mus., 52: 535. Busck, 1904. Proc. U. S. Natl. Mus., 27: 769. (as synonym of *C. fernaldella*). Busck, 1906. Proc. U. S. Natl. Mus., 30: 711. (as synonym of *C. fernaldella*). McDunnough, 1939. Mem. S. California Acad. Sci., 2: 63. (as synonym of *C. fernaldella*).

Cosmopterix nigrapunctella Busck, 1900. Proc. U. S. Natl. Mus., 23: 235.

Tongue shining buff. Labial palpi buff; a brown line starting ventrolaterally on second segment, becoming lateral on third segment; a second brown line on internal surface of third segment. Antennae with pecten present; olive-brown; ventral surface of scape and shaft white; a white line on anterior surface of scape, continued on shaft to one-half; apical segment brown, preceded by three white, one brown, one white, three brown, one white, one brown, then a series of segments one-half white and one-half brown. Face shining ochreous; vertex pale olive-brown with three white lines, one above each eye and one medial. Thorax pale olive-brown with continuation of three lines on vertex. Forewings pale olive-brown basally and distally; basal area with four white lines; a pale yellow fascia at one-half, bordered inwardly and outwardly by two silver spots; a small patch of black scales preceding inner dorsal spot, and one succeeding inner costal spot; fascia extending between spots basally and apically; a white line along outer margin from apical extension of fascia to apex of cilia; a patch of buff scales in costal cilia starting at outer costal spot; outer cilia buff-brown. Hindwings pale fuscous. Abdomen ochreous dorsally, shining buff ventrally. Legs shining buff basally; metathoracic tibiae pale olive-brown with a basal white streak extending dorsally to one-third; a second white streak starting at one-sixth extending dorsally to two-thirds; apex white; tarsi shining buff on inner and dorsal surfaces, olive-brown externally.

Male genitalia: (Fig. 47) R.W.H. slide no. 476.

Female genitalia: (Fig. 102) R.W.H. slide no. 852.

Alar expanse: 8-11 mm.

Food plant: unknown.

Type: *floridanella*, United States National Museum; *nigrapunctella*, United States National Museum.

Type locality: *floridanella*, Central Florida; *nigrapunctella*, Palm Beach, Florida.

Specimens examined: 45 ♂, 9 ♀. FLORIDA: Hastings, 4 ♂ [USNM, MCZ]; Archbold Biological Station, Highlands Co., 24 ♂, 7 ♀, March 27 through April 4, 1959 (R. W. Hodges), [CU, RWH]; Delray Beach, P. B. Co., 1 ♂, April 22, 1957 (C. P. Kimball), [CPK]; Homestead, 1 ♀, April 16, 1959 (D. O. Wolfenbarger), [CPK]; Lakeland, 1 ♂, March 1913 (C. N. Ainslie), [USNM]; Orlando, 2 ♂, February 26 and 28, 1918 (G. G. Ainslie), [USNM]; Royal Palm State Park, 1 ♂, March 17, 1939 (J. C. Bradley), [CU]; Siesta Key, Sarasota Co., 9 ♂, January 18 through May 21 (C. P. Kimball), [CPK]. MARYLAND: Washington, D. C., 1 ♂, June (Aug. Busck), [USNM]. MISSISSIPPI: Biloxi, 1 ♂, 1 ♀, June 13, 1917 [CU].

C. floridanella can be separated from *C. fernaldella*, *C. ebriola*, and *C. scirpicola* by the costomedial line starting at or very near the base of the forewing; in the other species it starts farther from the base. The produced, truncated medial area of the posterior margin of the seventh sternite in combination with the sclerotized area in the *ductus bursae* in the female genitalia will separate *floridanella* from the other North American species of *Cosmopterix*.

***Cosmopterix facunda*, new species**

(Figs. 106, 161)

Tongue gray-buff. Labial palpi (second segment of left palpus present) white with a dorsal and a ventral pale brown line. Antennae with pecten present; olive-brown; scape with ventral surface white and with an anterior white line; ventral surface of shaft white; white line on scape continued on shaft to one-half; apical four-and-one-half segments white, preceded by four-and-one-half olive-brown, one white, one brown, five white, then brown segments. Face dark gray-buff; vertex olive-brown with three white lines, one above each eye and one medial. Thorax olive-brown with continuation of white lines. Forewings pale olive-brown; a pale buff-yellow fascia at one-half; four blue-white lines in basal half; fascia bordered inwardly by two silver-white spots; costal one not reaching margin and followed by a small patch of black scales; dorsal silver spot starting beyond termination of costal one; a white costal line from fascia to one-fourth; fascia bordered outwardly by two silver-white spots, and extending be-

tween spots; a white dash in cilia costad of subcostal silver spot; a white line along dorsal margin beyond fascia to apex. Hindwings buff, cilia fuscous. Legs gray-buff basally, pale olive-brown distally; metathoracic tibiae with three annulations: one basal, one medial, and one terminal; apices of tarsal segments whitish.

Male genitalia: no specimens available.

Female genitalia: (Fig. 106) R.W.H. slide no. 900.

Alar expanse: 11 m.

Food plant: unknown.

HOLOTYPE: ♀, Brownsville, TEXAS, March 27, 1928 (F. H. Benjamin), [USNM Type No. 66081].

C. facunda can be separated from *C. delicatella*, *C. fernaldella*, *C. ebriola*, and *C. scirpicola* by the white apex of the antennae. The shape of the lamella antevaginalis, lacking the basal projection, in the female genitalia will serve to separate it from the same four species.

TANYGONA Braun

(Figs. 10, 16, 49, 108)

TYPE: *Tanygona lignicolorella* Braun, 1923. Original designation.

Tanygona Braun, 1923. Trans. American Ent. Soc., 49:115. McDunnough, 1939. Mem. S. California Acad. Sci., 2: 63.

Head smooth-scaled; tongue scaled, moderate; maxillary palpi minute, not folded over base of tongue; labial palpi recurved, reaching apex, smooth-scaled, second segment shorter than third, apex acute; antennae five-sixths, pecten present, scape long and enlarged distally. Dorsal surface of metathoracic tibiae with long hairs.

Forewings lanceolate, acuminate; 12 veins present; 1b furcate basally; 2 and 3 before end of cell, 2 weak, 3 not reaching margin; 5 connate with 6, 7, and 8; 6, 7, and 8 stalked, 6 very short; 10 arising before 2; 11 from middle of cell. Hindwings linear; a tuft of scales on costal margin; 5 veins present; 1b simple; 2, 3, and 5 missing; 6 and 7 stalked; 6 short, not reaching margin.

Male genitalia: *valvae* narrow, *costae* separate, fused to *aedeagus*; *aedeagus* ankylosed, *cornuti* absent; *tegumen* heavily sclerotized; *uncus* and *socii* absent; *brachia* subequal, left one longer than right, tapering gradually to apex.

Female genitalia: *bursa copulatrix* membranous; *signa* present or absent; *lamellae vaginales* forming a cylinder.

Tanygona is closely related to *Cosmopterix*. However, the connection and partial basal fusion of the *costae* with the *anellus*; the narrow, almost linear *valvae*; and the gradually tapering, subequal *brachia* of the male genitalia of *Tanygona* serve to distinguish it from *Cosmopterix*.

Cosmopterix ipomoeae is transferred to *Tanygona* because the male and female genitalia agree with those of *T. lignicolorella* and not with any known species of *Cosmopterix*. However, the pattern of the forewings is the same as that of *Cosmopterix*.

KEY TO THE SPECIES OF TANYGONA BASED UPON THE MACULATION

1. Base of forewings dark olive-brown *ipomoeae*
 Base of forewings buff-brown *lignicolorella*

KEY TO THE SPECIES OF TANYGONA BASED UPON THE MALE GENITALIA

1. *Valvae* angulate (Fig. 49) *lignicolorella*
 Valvae not angulate (Fig. 48) *ipomoeae*

KEY TO THE SPECIES OF TANYGONA BASED UPON THE
FEMALE GENITALIA

1. *Signa* present; lamellae vaginales forming a narrow tube
 (Fig. 109) *ipomoeae*
 Signa absent; lamellae vaginales forming a short, broad tube
 (Fig. 108) *lignicolorella*

***Tanygona lignicolorella* Braun**
(Figs. 49, 108, 162)

Tanygona lignicolorella Braun, 1923. Trans. American Ent. Soc., 49:116. McDunnough, 1939. Mem. S. California Acad. Sci., 2:63.

Tongue buff-white. Labial palpi buff-white with an incomplete brown line on internal and external surfaces of second and third segments; apices of second and third segments buff-white. Antennae brown basally, buff distally; an anterior and a posterior buff line on scape; these lines continued on shaft to two-thirds. Face shining buff-white with lavender reflections; a few brown scales anterior

to eyes; vertex brown with three white lines, one above each eye and one medial. Thorax brown with continuation of three white lines from vertex. Forewings buff-brown; an oblique blue-white line extending from costa at one-fifth to fold at one-half; another oblique blue-white line from costa at one-half to dorsal margin at two-thirds; a narrow blue-white fascia at four-fifths; apex of wings brown-black; cilia scales at apex buff basally, brown-black terminally, buff-gray elsewhere. Hindwings buff, cilia paler. Abdomen gray-brown. Legs buff-white, brown on dorsal surface of prothoracic and mesothoracic tibiae.

Male genitalia: (Fig. 49) R.W.H. slide no. 668.

Female genitalia: (Fig. 108) R.W.H. slide no. 669.

Alar expanse: 7 $\frac{1}{2}$ –9 mm.

Food plant: Unknown.

Type: Collection of Annette F. Braun.

Type locality: Cincinnati, Ohio.

Specimens examined: 5 ♂, 2 ♀. ILLINOIS: Putnam Co., 1 ♂, 1 ♀, July 12 and 17, 1959 (M. O. Glenn), [MOG]. MARYLAND: Plummer's Island, 1 ♂, July 1903 (A. Busck), [USNM]. NORTH CAROLINA: Highlands, Macon Co., 1 ♂, August 4, 1958 (R. W. Hodges), [RWH]. OHIO: Cincinnati, 1 ♂, 1 ♀, July 5 and 16 (Annette F. Braun), [AFB]. SOUTH CAROLINA: Cherry Hill Recreation Area, 2000 feet, Route 107, Oconee Co., 1 ♂, August 7, 1958 (R. W. Hodges), [RWH].

T. lignicolorella can be distinguished from *T. ipomoeae* by the characters given in the keys and by comparison with the illustrations of the wings.

***Tanygona ipomoeae* Busck, new combination**
(Figs. 48, 109, 163)

Cosmopteryx ipomoeae Busck, 1900. Proc. U. S. Natl. Mus., 23: 235. Dyar, 1901. Ent. Soc. Washington, 4: 478. Dyar, 1902 [1903]. List of the Lepidoptera of North America, Bull. U. S. Natl. Mus., 52: 535. Busck, 1906. Proc. U. S. Natl. Mus., 30: 710. McDunnough, 1939. Mem. S. California Acad. Sci., 2: 63.

Tongue buff-white. Labial palpi dark olive-brown. Antennae dark olive-brown; scape with an anterior white line continued on shaft to one-half; apical three segments white, preceded by five brown, one white, then brown segments. Face shining buff-brown on lower half, upper half of face and vertex brown. Thorax dark olive-brown with a medial blue-white line. Forewings dark olive-

brown basally and distally; four narrow blue-white lines on basal half, subcostal one broken; a pale straw-colored fascia at three-fifths, bordered inwardly by two silver-white spots and outwardly by two silver-white spots, costal ones not reaching costal margin, dorsal ones on margin; a few black scales following costo-basal silver-white spot; a streak, concolorous with fascia, in costal cilia from outer spot; a buff-white line on dorsal margin from end of fascia to apex of wing; dorsal cilia slightly paler than base of wing. Legs shining buff-white basally, brown distally; prothoracic legs with a dorsal white line on tibiae and tarsi; metathoracic tibiae with an oblique white, with lavender reflections, streak from base to base of medial tibial spurs, then dorsad to one-half; apex white; apices of metathoracic tarsal segments white; inner surface of legs buff-white.

Male genitalia: (Fig. 48) R.W.H. slide no. 501.

Female genitalia: (Fig. 109) R.W.H. slide no. 903.

Alar expanse: 7–8 mm.

Food plant: *Ipomoea* sp. Dyar (1901) gives the following description of the larval habits of *ipomoeae*: "The larvae are leaf miners in 'morning glory' (*Ipomoea* sp.). The mine is an irregular series of blotches and lobes, usually elongate and several partly joined; taking all the parenchyma between the two epidermes, the skin strengthened by the web, so that the surface is wrinkly. Frass partly ejected, held to the leaf by a close web. . . . Spun a fine silken cocoon between leaves or in a folded leaf."

Type: United States National Museum. Only one of the two specimens which Busek mentions in the original description is in the Museum; I designate this specimen as the **lectotype**.

Type locality: Palm Beach, Florida.

Specimens examined: 1 ♂, 1 ♀. FLORIDA: Fort Lauderdale, 1 ♀, reared *ex* morning glory, emerged May 21, 1945 [USNM]; Palm Beach, 1 ♂, no date (Dyar), [USNM].

T. ipomoeae can be separated from *T. lignicolorella* by the characters given in the keys. It is likely that a genitalic preparation will be necessary to separate it from the species of *Cosmopterix*.

Eralea, new genus

έρως = love, ἀλέα = warmth

(Figs. 3, 18, 51, 110)

Type: *Eriphia albalineella* Chambers, 1878.

Head smooth-scaled; tongue scaled, well developed; maxillary

palpi folded over base of tongue; labial palpi smooth-scaled, recurved, not reaching apex, second segment longer than third, apex acute; antennae two-thirds to three-fourths, pecten present, scape elongate and slightly swollen distally. Dorsal surface of metathoracic tibiae with long scales.

Forewings lanceolate, apex acute; 12 veins present; 1b furcate basally; 2 and 3 before end of cell; 6, 7, and 8 stalked, 8 weak; 10 opposite 2; 11 from middle of cell. Hindwings linear; a tuft of scales on costal margin; 8 veins present; 1b simple; 1, 2, 3, and 4 evanescent; 6 and 7 stalked, divergent.

Male genitalia: *valvae* lobate, rounded apically; *costae* separate, short, lobate; *tegumen* heavily sclerotized; *uncus* and *socii* absent; arms of *gnathos* separate, asymmetrical, left *brachium* longer than right one; *aedeagus* short, cylindrical, a basal process from dorsal surface, ankylosed.

Female genitalia: *bursa copulatrix* membranous; two *signa*, cornucopia shaped; *lamella antevaginalis* sclerotized, forming a plate in front of ostium; *apophyses* moderately short.

Eralea differs from *Stigmatophora* in the following characters: the second segment of the labial palpi of *Eralea* is longer than the third; in *Stigmatophora* the third segment is longer than the second. The second segment of the labial palpi of *Eralea* is not thickened ventrally; that of *Stigmatophora* is thickened ventrally. The scales on the dorsal surface of the metathoracic tibiae of *Eralea* are long and thin; those of *Stigmatophora* are normal. In the hindwings veins 1 through 5 are evanescent in *Eralea*; these veins are well developed in *Stigmatophora*. In the male genitalia of *Eralea* the *costae* are symmetrical and not fused with the *anellus*; those of *Stigmatophora* are asymmetrical and fused with the *anellus*. The female genitalia of the two genera are very similar, indicating their close relationship.

Two species of *Eralea* are known from the southern United States, one from Florida and one from Texas and Arizona. Future collecting will probably extend the known ranges of these species.

KEY TO THE SPECIES OF ERALEA BASED UPON THE MACULATION

1. Vertex dark brown *striata*
 Vertex pale buff-white *albalinecella*

KEY TO THE SPECIES OF ERALEA BASED UPON THE MALE GENITALIA

1. Ventral margin of costa concave *striata*
 Ventral margin of costa almost straight *albalinecella*

***Eralea albalineella* Chambers, new combination**

(Figs. 51, 110, 163)

Eriphia (?) *albalineella* Chambers, 1878. Bull. U. S. Geol. Geog. Surv. Terr., 4: 95.

Eriphia albalineella, Dyar, 1902 [1903]. List of the Lepidoptera of North America, Bull. U. S. Natl. Mus., 52: 540.

Tanygona albalineella, Braun, 1923. Trans. American Ent. Soc., 49: 115. McDunnough, 1939. Mem. S. California Acad. Sci., 2: 63.

Tongue white to pale gray. Labial palpi brown with a dorsal and a ventral buff line on second and third segments. Antennae buff, scape with a broad dorsoposterior brown line continued on shaft to one-third, a faint brown line on anterior surface of scape and basal part of shaft. Face and vertex buff-white, brown anterior to and dorsad of eyes, brown along cervical margin. Thorax brown with three blue-white lines, two lateral and one medial. Forewings brown-black; an oblique buff-white line from costal margin at base to dorsal margin at two thirds; a second starting from costal margin at one-half to middle of wing at three-fourths; and a short one in middle of wing at five-sixths; costal cilia buff; apical cilia buff basally, brown distally; dorsal cilia buff with some brown flecks. Hindwings buff, cilia gray. Legs shining buff; outer surface of metathoracic tibiae with a broad gray-brown streak from base to one-half, another from one-half to nine-tenths; metathoracic tarsi gray-brown on dorsal surface of first segment and basal half of second.

Male genitalia: (Fig. 51) R.W.H. slide no. 868.

Female genitalia: (Fig. 110) R.W.H. slide no. 869.

Alar expanse: 8-9 mm.

Food plant: Unknown.

Type: Museum of Comparative Zoology.

Type locality: Bosque Co., Texas.

Specimens examined: 1 ♂, 2 ♀. ARIZONA: Chiricahua Mts. near Portal, Cochise Co., 1 ♂, 1 ♀, July 5, 1939 (Annette F. Braun), [AFB]. TEXAS: [Bosque Co.], 1 ♀, "3/3" [MCZ].

The buff-white line from the base of the forewings of *albalineella* is narrower than the one of *E. striata*. This character, in combination with the pale vertex, will separate *albalineella* from *striata*.

Eralea striata, new species

(Figs. 50, 165)

Tongue white basally, gray distally. Labial palpi brown with a ventral white line on second and third segments. Antennae buff-white, scape brown except for an anterior white line, pecten brown, base of shaft pale brown. Face gray-brown with lavender reflections; two oblique white streaks, one from base of each antenna to base of tongue; vertex brown. Thorax brown; patagia white on inner and outer margins. Forewings buff-white to white; a broad white band from base of wing to dorsal margin at one-half; an oblique white line near base running from near costal margin to medial white band; a row of brown scales at apex of wing; cilia with pale brown flecks basally, buff-white distally. Hindwings pale fuscous. Legs buff-white; prothoracic legs with an anterior brown line; metathoracic tibiae with a brown streak from base to one-half, another from two-thirds to nine-tenths; metathoracic tibiae with brown on dorsal surface of first, second, and third segments.

Male genitalia: (Fig. 50) R.W.H. slide no 925.

Female genitalia: No specimens available.

Alar expanse: 8 mm.

Food plant: Unknown.

HOLOTYPE: ♂, Siesta Key, Sarasota, Co., FLORIDA, May 13, 1960 (C. P. Kimball), [CU Type No. 3812].

PARATYPE: Oneco, Manatee Co., FLORIDA, 1 ♂, May 19, 1953 (Paula Dillman), [CPK].

Melanocinclis, new genus

μέλαν = black pigment, κινκίς = latticed gate

(Figs. 8, 15, 57, 116)

Type: *Melanocinclis lineigera*, sp. nov.

Head smooth-scaled; tongue scaled, well developed; maxillary palpi minute; labial palpi recurved, not reaching vertex, second segment longer than third and slightly thickened ventrally, third segment rough-scaled, apex acute; antennae three-fourths, pecten present, simple, scape long and broad. Metathoracic tibiae with long hairs on dorsal surface.

Forewings lanceolate, acuminate; 10 veins present; 2 and 4 absent; 1b furcate basally; 3 before end of cell, not reaching margin; 6, 7, and 8 stalked; 9 from end of cell; 10 before 3; 11 from middle of cell. Hindwings linear; a series of scales on costal

margin; 4 veins present; 2, 3, 5, and 6 absent; 1b simple.

Male genitalia: *valvae* linear, expanded distally; *costae* separate, fused to *anellus*; *anellus* heavily sclerotized; *aedeagus* ankylosed, *cornuti* absent; *tegumen* heavily sclerotized; *uncus* and *socii* absent; *brachia* broad basally, aciculate distally, subequal in length.

Female genitalia: *bursa copulatrix* membranous; *signa* absent; *lamellae vaginales* forming an irregularly shaped tube; apophyses long.

Melanocinclis differs from *Tanygona* in the following characters: The third segment of the labial palpi is rough-scaled and shorter than the second segment; that of *Tanygona* is smooth and longer than the second segment. Veins 2 and 4 of the forewing of *Melanocinclis* are absent, whereas these veins are present in *Tanygona*. Vein 6 is absent in the hindwing of *Melanocinclis*; it is present in *Tanygona*. In the male genitalia the *brachia* of *Melanocinclis* are very slender apically; those of *Tanygona* are shorter and stouter. The configuration of the *lamellae vaginales* of *Melanocinclis* is irregular; the *lamellae vaginales* of *Tanygona* form a straight tube.

The paucity of specimens of the known species of *Melanocinclis* make it difficult to give an accurate statement as to the geographic range of the genus. *M. lineigera* occurs in Florida, and *M. nigrilineella* occurs in Texas and Arizona.

I am placing *E. nigrilineella* Chambers in *Melanocinclis* because the general facies agree very well with the type of the genus. Chambers (1878) was quite correct in questioning the generic placement of *nigrilineella*.

KEY TO THE SPECIES OF MELANOCINCLIS BASED UPON THE MACULATION

1. Forewings dusted with tawny flecks *lineigera*
Forewings dusted with black flecks *nigrilineella*

KEY TO THE SPECIES OF MELANOCINCLIS BASED UPON THE MALE GENITALIA

1. Right brachium with a lateral process (Fig. 57) *lineigera*
Right brachium without a lateral process (Fig. 56) *nigrilineella*

Melanocinclis lineigera, new species

(Figs. 57, 116, 168)

Tongue white. Labial palpi white; basal half of second segment black, a few ventral black scales before apex; third segment with a black annulation at two-fifths and one at four-fifths; apex black. Antennae with pecten black; scape white with a black saddle on posterior surface, apex white; apical segment fuscous, preceded by one-and-one-half buff-white, one-and-one-half fuscous, one buff-white, one-half fuscous, one buff-white, one-and-one-half fuscous, two buff-white, four-and-one-half fuscous, *etc.* Face and vertex white, lower half of face dark gray with purple reflections, a few black flecks above eyes. Thorax white medially, black laterally, patagia white with tawny flecks laterally. Forewings white overlaid with tawny flecks; a broad oblique black band from base at costal margin to one-half at center; a second black band starting at one-half on costa running to apex of wing below costa; black dorsad of fold from base of wing to one-fourth, sometimes reaching margin; cilia with a black medial line and a fuscous terminal line from apex to a point parallel with dorsal margin. Hindwings shining gray. Abdomen brown-black with ochreous scales dorsally, buff ventrally. Legs shining white; metathoracic tibiae with an oblique black stripe at four-fifths, dorsal surfaces of spurs black, under certain light conditions; metathoracic tarsi with a broad black annulation on middle of first segment, black at apex of second segment and at base of third segment.

Male genitalia: (Fig. 57) R.W.H. slide no. 919.

Female genitalia: (Fig. 116) R.W.H. slide no. 781.

Alar expanse: $5\frac{1}{2}$ – $6\frac{1}{2}$ mm.

Food plant: *Pinus caribaea* Morelet.

HOLOTYPE: ♀, Archbold Biological Station, Highlands Co., FLORIDA, March 31, 1959 (R. W. Hodges), [CU Type No. 3813].

PARATYPES: same locality as type, 3 ♂, March 29 and April 4, 1959 [RWH]; Homestead, Florida, 2 ♂, February 9 and March 21, 1959 (D. O. Wolfenbarger), [CPK]; Lake City, Florida, 1 ♂, 1 ♀, reared *ex* Slash Pine cones, emerged February 7, 1951 (C. F. Spears), [USNM]; Siesta Key, Sarasota Co., Florida, 5 ♂, 5 ♀, March 31 through May 3, 1960 (C. P. Kimball), [CPK, RWH].

Other specimens examined: Homestead, FLORIDA, 1 ♂, 2 ♀, February 8 and April 16, 1959 (D. O. Wolfenbarger), [CPK]; Siesta Key, Sarasota Co., Florida, 3 ♂, 2 ♀, February 25 through May 13 (C. P. Kimball), [CPK, RWH].

The tawny flecks on the forewings will separate *lineigera* from *M. nigrilineella*.

Melanocinclis nigrilineella Chambers, new combination.

(Figs. 56, 167)

Eriphia (?) *nigrilineella* Chambers, 1878. Bull. U. S. Geol. Geog. Surv. Terr., 4: 96. Chambers, 1880. Jour. Cincinnati Soc. Nat. Hist., 2: 204, f. 42.

Eriphia nigrilineella, Dyar, 1902 [1903]. List of the Lepidoptera of North America, Bull. U. S. Natl. Mus., 52: 540. McDunnough, 1939. Mem. S. California Acad. Sci., 2: 64.

Tongue white. Labial palpi white; second segment black to two-thirds, a few black scales ventrally before apex; third segment with a black annulation at two-fifths and another at four-fifths. Antennae buff-white, pecten ochreous, no pattern of black and white on specimen available. Head white, lower two-thirds of face gray with purple reflections, vertex with lavender reflections. Thorax black medially, white laterally. Forewings white with a light dusting of black flecks; a pattern of two oblique black bands as in *M. lineigera*, but basal one interrupted medially; black at end of fold; cilia white, heavily dusted with black at apex, a few black flecks between apex and dorsal margin, no markings dorsad of wing margin. Hindwings gray. Legs shining white; metathoracic tibiae with an oblique black stripe at four-fifths, dorsal surfaces of spurs black, under certain light conditions; metathoracic tarsi with a broad black annulation on middle of first segment, black at apex of second segment and at base of third segment.

Male genitalia: (Fig. 56) R.W.H. slide no. 921.

Female genitalia: no specimens available.

Alar expanse: 7 mm.

Food plant: unknown.

Type: Museum of Comparative Zoology.

Type locality: Bosque County, Texas.

Specimens examined: 2 ♂. ARIZONA: Madera Canyon, 4880 feet, Santa Rita Mountains, Santa Cruz Co., 1 ♂, June 30, 1959 (R. W. Hodges), [RWH]. TEXAS: Bosque Co., 1 ♂, no date [MCZ].

M. nigrilineella can be separated from *M. lineigera* by the black dusting on the forewings.

Eteobalea, new genus

εἴεός = true, βάλιός = spotted

(Figs. 2, 20, 53, 113)

Type: *Gelechia sexnotella* Chambers, 1878.

Head smooth-scaled; tongue scaled, moderately short; maxillary palpi folded over base of tongue; labial palpi recurved, reaching beyond vertex, first and second segments smooth dorsally, second segment tufted ventrally, third segment smooth, second and third segments subequal; antennae three-fourths, pecten present, simple.

Forewings broadly lanceolate, apex acute; 1b furcate basally, sometimes furcate distally; 2 from two-thirds; 2, 3, 4, and 5 equidistant, subparallel; 5 connate with 6, 7, and 8; 6, 7, and 8 stalked; 10 slightly before 3; 11 from two-fifths of cell. Hindwings lanceolate, apex acute; no tuft of scales on costal margin; 8 veins present; 1b simple; 2, 3, 4, and 5 equidistant, subparallel; 6 and 7 stalked, divergent.

Male genitalia: *costae* separate from *valvae*; right *costa* smaller than left one, partially fused with *aedeagus*; *valvae* lobate, slightly expanded distally; *aedeagus* shaped like a long-necked vase without a well defined base, ankylosed; *cornuti* absent; *tegumen* heavily sclerotized; *tuba analis* emerging between brachia; *tegumen* emarginate apically; left *brachium* larger than right one, apex enlarged, blunt.

Female genitalia: *lamellae vaginales* small, heavily sclerotized, mainly developed anterior to *ostium bursae* with a narrow band encircling posterior part of *ostium bursae*; *ductus bursae* slender, lightly sclerotized; *corpus bursae* lightly sclerotized; *signa* present.

Eteobalea differs from *Stigmatophora* (Figs. 58, 111) in the following characters: the second segment of the labial palpi is tufted ventrally in *Eteobalea*; rough-scaled in *Stigmatophora*. The second and third segments of the labial palpi are subequal in *Eteobalea*; the second segment is shorter than the third in *Stigmatophora*. In the male genitalia of *Eteobalea* the left *brachium* is large, the apex is blunt and slightly enlarged, the right *brachium* is a blunt lobe; in *Stigmatophora* the *brachia* are slender, subequal, and taper to the apices.

McDunnough (1939) lists six species in *Stigmatophora*. Of these *S. iridella*, *S. sexnotella*, and *S. wyattella* are transferred to *Eteobalea*; *S. niphochrysa* is a synonym of *iridella*; and *S. ceanothiella* and *S. gleditschiaeella* are transferred to *Periploca* in the Walshiidae. In addition one new species is described, bringing the number of known species for our fauna to four.

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KEY TO THE SPECIES OF ETEOBALEA BASED UPON THE MACULATION

1. Forewings black with white spots 2
 Forewings brown or bronze 3
2. Hindwings light fuscous; base of tongue white, base of forewings usually black *sexnotella*
 Hindwings dark fuscous; base of tongue black; base of forewings white *wyattella*
3. Base of second segment of labial palpi bronze-black *enchrysa*
 Base of second segment of labial palpi white *iridella*

KEY TO THE SPECIES OF ETEOBALEA BASED UPON THE MALE GENITALIA

1. Apex of left brachium four or more times width of narrowest part of brachium (Fig. 52) *iridella*
 Apex of left brachium less than three times width of narrowest part of brachium 2
2. Apex of left brachium more than twice width of narrowest part of lobe (Fig. 55) *wyattella*
 Apex of left brachium less than twice width of narrowest part of lobe 3
3. Left brachium with a lobate medial projection (Fig. 54) *enchrysa*
 Left brachium without a medial projection (Fig. 53) *sexnotella*

KEY TO THE SPECIES OF ETEOBALEA BASED UPON THE FEMALE GENITALIA

1. Lamella postvaginalis subtriangular, lightly sclerotized; two, lightly sclerotized signa in form of triangular plates (Fig. 113) *sexnotella*
 Lamella postvaginalis not subtriangular, heavily sclerotized; signa heavily sclerotized 2
2. Lamellae vaginales irregularly margined with constriction before anterior termination; signa with irregular margins (Fig. 114) *wyattella*
 Genital plate and signa with smooth margins 3
3. Lamellae vaginales subreniform (on right side); signa one-third to one-half length of corpus bursae (Fig. 112) *iridella*
 Lamellae vaginales subquadrate; signa one-seventh to one-eighth length of corpus bursae (Fig. 115) *enchrysa*

Eteobalea sexnotella Chambers, new combination
(Figs. 53, 113, 197)

- Gelechia sexnotella*, Chambers, 1878. Bull. U. S. Geol. Geog. Surv. Terr., 4: 88. Hagen, 1884. Papilio, 4: 99. Riley, in Smith, 1891. List of the Lepidoptera of Boreal America, 102.
Mompha sexnotella, Busck, 1902. Jour. New York Ent. Soc., 10: 97. Dyar, 1902 [1903]. List of the Lepidoptera of North America, Bull. U. S. Natl. Mus., 52: 543.
Stigmatophora sexnotella, Walsingham, 1907. Proc. U. S. Natl. Mus., 33: 219. Barnes and McDunnough, 1917. Check list of the Lepidoptera of Boreal America, 153. McDunnough, 1939. Mem. S. California Acad. Sci., 2: 64.
Laverna sexnotella, Forbes, 1923. Lepidoptera of New York and neighboring state, Cornell Univ. Agric. Exp. Sta. Mem., 68: 324.

Tongue and maxillary palpi white. Labial palpi white with three black annulations: one at base of second segment, one at two-fifths and one at four-fifths on third segment. Face and vertex white, a fuscous line from base of each antenna to base of tongue, a row of black scales along posterior edge of eyes. Antennae: scape white on ventral surface and at apex, black on dorsal surface; shaft black with fuscous annulations, becoming white on outer third. Thorax black. Forewings black with six shining white spots; basal white spot broken in area of fold. Hindwings light fuscous. Abdomen dirty yellow, last segment fuscous. Legs black; metathoracic tibiae with three white stripes: one at one-fourth, one at two-thirds, and one apical; tarsal segments with white apices; base of first tarsal segment white.

Male genitalia: (Fig. 53) R.W.H. slide no. 830.

Female genitalia: (Fig. 113) R.W.H. slide no. 831.

Alar expanse: 8-14 mm.

Food plant: *Trichostema dichotomum* L., *T. suffrutescens* Kearney. The larva is a stem gall former.

Type: Museum of Comparative Zoology.

Type locality: Bosque County, Texas.

Specimens examined: 75 ♂, 31 ♀. CONNECTICUT: East River, 1 ♂, August 6, 1907 (Chas. R. Ely), [USNM]; same locality, 8 ♂, July 8-21 [MCZ]; Putnam, 1 ♀, May 27, 1933 (A. B. Klots), [ABK]. FLORIDA: Archbold Biological Station, Highlands Co., 2 ♂, 4 ♀, March 27 through April 2, 1959 (R. W. Hodges), [RWH]; same locality, 1 ♂, 1 ♀, July 15-31, 1948 (A. B. Klots), [ABK]; Georgiana, 1 ♂, 1 ♀, gall on *Trichostema dichotomum*, emerged

July 11, 1882 (Wm. Winfield), [USNM]; Longboat Key, Sarasota, 1 ♀, gall on *Trichostema suffrutescens*, emerged January 31, 1945 (J. G. Needham), [CU]; Oneco, 1 ♂, May 28, 1953 (Paula Dillman), [CPK]; Sarasota, 2 ♂, 1 ♀, February 1945 (J. G. Needham), [CU]; Siesta Key, Sarasota Co., 2 ♀, April 24 and May 4, 1960 (C. P. Kimball), [CPK]. KANSAS: Onaga, 1 ♀ [MCZ]. MARYLAND: Frederick, 3 ♂, June 11, 1906 [MCZ]; Hyattsville, 1 ♂, June (A. Bsk), [LACM]; Washington, D. C., 2 ♂, May 21, 1906 (Chas. R. Ely), [USNM]; same locality, 1 ♂, 1 ♀, May and June (A. Bsk), [USNM, MCZ]. MASSACHUSETTS: Barnstable, 8 ♂, 3 ♀, June 5 through July 24 (C. P. Kimball), [CPK]; Magnolia, 1 ♂, June 3, 1908 [USNM]; Martha's Vineyard, 2 ♂, "1-VI and VIII-23" (F. M. Jones), [USNM]. MISSISSIPPI: Biloxi, 1 ♂, June 13, 1917 [CU]; Ocean Springs, 1 ♂, June 28, 1921 (F. H. Benjamin), [USNM]. NEW HAMPSHIRE: Webster, 1 ♀, "6/190" [MCZ]. NEW JERSEY: Essex Co. Park, 3 ♂, August 2-16, 1906 (W. D. Kearfott), [USNM]; Ramsey, 1 ♂, August 19, 1909 [AMNH]. NORTH CAROLINA: Maxton, 7 ♂, 4 ♀, April 23 through August 31, 1944 (A. B. Klots), [ABK]; Southern Pines, 22 ♂, 4 ♀, May through August 31 [USNM]. OHIO: Clermont Co., 1 ♂, reared *ex* gall on *Trichostema dichotomum*, emerged June 1932 (Annette F. Braun), [AFB]; Fort Hill, Highland Co., 2 ♂, 2 ♀, under rearing record B. 1930, emerged June 19 through July 9, 1942 (Annette F. Braun), [AFB]. TEXAS: Bosque Co., 1 specimen, "11/9" [MCZ]. VIRGINIA: Great Falls, 1 ♂, 1 ♀, May 28, 1919 (A. Busck), [USNM]. ONTARIO: Dunrobin: 1 ♀, June 25, 1941 (G. A. Hobbs), [CNC]; Trenton, 1 ♀, June 14, 1908 (Evans), [USNM].

E. sernotella can be distinguished from *E. wyattella* by the base of the tongue being white.

***Eteobalea wyattella* Barnes and Busck, new combination**

(Figs. 55, 114, 198)

Stagmatophora wyattella Barnes and Busck, 1920. Contributions to the natural history of the Lepidoptera of North America, 4: 222. McDunnough, 1939. Mem. S. California Acad. Sci., 2: 64.

Laverna wyattella, Forbes, 1923. Lepidoptera of New York and neighboring states, Cornell Univ. Agric. Exp. Sta. Mem., 68: 324.

Tongue black at base and on undersurface, white on upper surface and tip. Maxillary palpi gray. Labial palpi white with three black annulations: one at base of second segment, one at one-

fifth, and one at four-fifths on third segment. Face and vertex shining white, a collar of black scales, a line of black scales from base of each antenna to base of tongue. Antennae: scape black with a few white scales at apex; shaft with alternating annulations of white and black scales, black at outer four-fifths, followed by alternating black and white. Thorax black. Forewings with shining black and white markings. Hindwings shining dark fuscous. Abdomen dark fuscous dorsally and ventrally on anterior portion of segments, ventral surface shining white. Prothoracic legs black with shining white on inner surface of tibiae, base and apex white; first tarsal segment with a broad black medial annulation; second with a white basal annulation extending distally on dorsal surface; third and fourth segments black; fifth segment white; mesothoracic and metathoracic legs with similar maculation but with more extensive white markings.

Male genitalia: (Fig. 55) R.W.H. slide no. 727.

Female genitalia: (Fig. 114) R.W.H. slide no. 833.

Alar expanse: 13–16 mm.

Food plant: unknown.

Type: United States National Museum.

Type locality: Palos Park, Illinois.

Specimens examined: 22 ♂, 7 ♀. ILLINOIS: Beverly H's, 1 ♂, August 21, 1909 (W. J. Gerhard), [CNHM]; Chicago, 1 ♂, August 14, 1912 [MCZ]; Edgebrook, 2 ♂, 2 ♀, July 15–27 (A. K. Wyatt), [USNM, CNHM]; Palos Park, 2 ♂, 1 ♀, July 15, 1911 (A. K. Wyatt), [USNM]; Putnam Co., 11 ♂, 4 ♀, July 7 through August 8 (M. O. Glenn), [MOG, RWH]. NEW YORK: Ithaca, Six Mile Creek, Tompkins Co., 3 ♂, July 26 through August 8 (J. G. Franclemont), [JGF]; same locality, 1 ♂, July 21, 1939 [CU]; Orient, Long Island, 1 ♂, August 22, 1936 (Roy L. Latham), [CU].

E. wyattella can be distinguished from *E. scernotella* by the darker color of the hindwings and by the base of the tongue being black. The characters of the male and female genitalia are given in the keys.

***Eteobalea iridella* Busck, new combination**
(Figs. 52, 112, 166)

Mompha iridella Busck, 1907. Proc. Ent. Soc. Washington, 8: 96.
Stagmatophora iridella, Barnes and McDunnough, 1917. Check list of the Lepidoptera of Boreal America, 153. McDunnough, 1939. Mem. S. California Acad. Sci., 2: 64.

Stagmatophora niphochrysa Meyrick, 1930. Exot. Micr., 3: 546. **new synonymy.** McDunnough, 1939. Mem. S. California Acad. Sci., 2: 64.

Tongue, maxillary palpi, labial palpi, face, and vertex white. Antennae dark brown with light fuscous annulations along shaft. Thorax gold-brown, patagia white. Forewings gold-brown with white and metallic gold spots; cilia white at apex, light fuscous dorsally. Hindwings light fuscous, almost white at base. Legs gold-brown basally; metathoracic tibiae white with a brown annulation at one-half and another at four-fifths; tarsi white; a dorsal median brown patch on first segment; brown basally on second, third, and fourth segments; fifth segment brown. Abdomen brown with apices of segments light fuscous. Some specimens much darker, having gold-brown replaced by dark brown. In this form third segment of labial palpi sometimes brown except for white apex; and face, vertex, and thorax brown.

Male genitalia: (Fig. 52) R.W.H. slide no. 382.

Female genitalia: (Fig. 112) R.W.H. slide no. 381.

Alar expanse: 9–13 mm.

Food plant: unknown.

Type: United States National Museum.

Type locality: Claremont, California.

Specimens examined: 48 ♂, 30 ♀. ARIZONA: Mayer, 1 ♂, June 3, 1959 [MOG]. CALIFORNIA: Berkeley, 1 ♀, April 2, 1959 (D. D. Linsdale), [RWH]; Berkeley-U. of C., 1 ♂, 1 ♀, April 4, 1959 (Chemsack and Powell), [JAP]; Colfax, Placer Co., 1 ♂, April (A. H. Vachell), [USNM]; Gavilan Hills, 1 ♀, July 19, 1939 (C. R. Henne), [RWH]; Hastings Res. near Jamesburg, 1 ♂, May 3, 1958 (J. A. Powell), [JAP]; Loma Linda, 4 ♂, 3 ♀, February 17 through August 21 (G. R. Pilate), [AFB, USNM]; Los Angeles Co., 2 ♂, 2 ♀, August (Koebele), [CAS]; nine miles E. King City, Monterey Co., 1 ♂, March 29, 1959 (C. W. O'Brien), [JAP]; Olan-cha, Inyo Co., 1 ♂, "1-7-V" [USNM]; Oroville, 29 ♂, 18 ♀, May 29 through July 15 (H. H. Keifer), [CAS, RWH]; Palm Springs, 1 ♀, March 26, 1917 [AFB]; Sacramento, 2 ♂, July 12, 1933 (H. H. Keifer), [USNM]; San Diego, San Diego Co., 1 ♂, August 31, 1921 (E. Piazza), [USNM]; San Diego, 2 ♀, May 31, 1924 and August 30, 1921 [USNM]; Webber Creek nr. Camino, El Dorado Co., 3 ♂, June 25, 1959 (J. A. Powell), [JAP]. TEXAS: Fort Davis, 5000 ft., "5.28" [USNM]. WASHINGTON: Pullman, 1 ♂, July 12, 1898 (C. V. Piper), [USNM].

E. iridella can be distinguished from *E. enchrysa* by the base of the second segment of the labial palpi being white. See the comments under *enchrysa* for the diagnostic characters of the male and female genitalia.

Eteobalea enchrysa, new species

(Figs. 54, 115, 199)

Tongue slightly reduced, white. Maxillary palpi white. Labial palpi white, base of second segment burnished brown on outer surface, third segment with a black annulation at one-fourth and another at five-sixths. Antennae brown-black, undersurface and apex of scape white. Face and vertex white. Thorax brown, disc with purple reflections, patagia and collar burnished brown. Forewings burnished brown with irregular pattern of metallic lead colored spots from one-fourth to apex of wing, also along outer one-third of dorsal margin; a short subcostal white patch at one-fourth, another at one-half; a costal patch of white scales from two-thirds to five-sixths; cilia dark fuscous. Hindwings fuscous. Undersurface of all wings with white at apices. Abdomen gray-brown, apex of last segment white. Legs burnished gray-brown; metathoracic tibiae with a subdorsal, post medial, and apical white stripe on outer surface; inner surface white; apices of tarsal segments white.

Male genitalia: (Fig. 54) R.W.H. slide no. 474.

Female genitalia: (Fig. 115) R.W.H. slide no. 596.

Alar expanse: 13–16 mm.

Food plant: *Trichostoma lanatum* Ben.

HOLOTYPE: ♂, Cajon Valley, San Bernardino Co., CALIFORNIA, emerged June 30, 1938 (C. Dammers), [USNM Type No. 66082].

PARATYPES: 17 ♂, 9 ♀, same data as type, June 16 through July 20, 1938 [USNM, CU, LACM, MCZ, RWH].

E. enchrysa can be distinguished from *E. iridella* by the base of the second segment of the labial palpi being bronze-black; in *iridella* this area is white. In the male genitalia the apex of the left *brachium* of *enchrysa* is less than twice the width of the narrowest part of the *brachium*; in *iridella* this structure is four or more times the width of the narrowest part. The *signum* of the female genitalia of *enchrysa* is one-third to one-half the length of the *corpus bursae*; in *iridella* the *signum* is one-seventh to one-eighth the length of the *corpus bursae*.

Sathrobrotia, new genus

σαθρός = decayed, βρωτήρ = eating

(Figs. 5, 13, 59, 117)

Type: *Batrachedra rileyi* Walsingham, 1882.

Head smooth-scaled; tongue scaled, moderately developed; maxillary palpi folded over base of tongue; labial palpi recurved, reaching beyond vertex, smooth-scaled, second segment thickened ventrally, third segment longer than second, apex acute; antennae two-thirds, simple, pecten present, scape enlarged for entire length, width equals one-half length. Metathoracic tibiae with long dorsal scales.

Forewings lanceolate, apex subfalcate; 12 veins present; 1b furcate basally; 2 and 3 approximate at base, parallel; 5, 6, 7, and 8 stalked; 10 almost opposite 2; 11 from two-thirds on cell. Hindwings sublinear; a series of scales on costal margin; 8 veins present; 1b simple; 2, 3, and 4 subparallel, arising equidistant; 5 present at margin; 6 and 7 stalked, divergent.

Male genitalia: *valvae* lanceolate, rounded apically, fused basally; right *costa* separate from *valva*, linear; left *costa* reduced; *aedeagus* ankylosed; *uncus* and *socii* absent; *brachia* heavily sclerotized, cylindrical, apices acute, left *brachium* longer than right one.

Female genitalia: *bursa copulatrix* membranous, *signa* small (if present); *lamellae vaginales* forming a cylinder.

Sathrobrotia differs from *Pyroderces* (Figs. 62, 119) in the following characters: veins 2 and 3 in the forewings of *Sathrobrotia* are approximate; distant in *Pyroderces*. In the male genitalia the right *costa* of *Sathrobrotia* is free and linear; that of *Pyroderces* is stout and fused basally to the *aedeagus*. The *brachia* of *Sathrobrotia* have acute apices; those of *Pyroderces* are blunt. In the female genitalia of *Sathrobrotia* the *lamellae vaginales* are fused and are long and cylindrical; those of *Pyroderces* are short, encircling the *ostium*.

Two species of *Sathrobrotia* are known to occur within the geographic limits specified by this paper. One, *S. rileyi*, is a scavenger which has been reared from rotten cotton bolls, corn husks, Milo maize, and the flower heads of castor bean and *Mesosphaerum rugosum*. The other species, *S. badia*, is also a scavenger; however, the hosts are different. They are peach mummies, loquat mummies, limes, grapefruit, cabbage, blossoms of cocoanut, bananas, infected cones of *Pinus* spp., and elm leaves. Unfortunately, the two species have been confused with the result that the literature is not to be trusted as to the identity of the species.

Walsingham's original description of *rileyi* states that the specimens were reared from cotton bolls, restricting the name to this species. It has been suggested that *S. stigmatophora* Walsingham was the second species of *Sathrobrotia* which occurred in the United States, however, examination of the specimens determined as *stigmatophora* has revealed that they are *rileyi*. Also, the description of *stigmatophora* suggests that the name may be a synonym of *rileyi*. On this basis I have described the second species of *Sathrobrotia* as new.

KEY TO THE SPECIES OF SATHROBROTA BASED UPON THE MACULATION

1. Outer surface of metathoracic tibiae brown basally and distally, median white streak with a dorsolateral row of brown scales *rileyi*
 Outer surface of metathoracic tibiae tawny before median annulation, brown beyond it, median annulation unicolorous *badia*

KEY TO THE SPECIES OF SATHROBROTA BASED UPON THE MALE GENITALIA

1. Apex of right costa blunt (Fig. 59) *rileyi*
 Apex of right costa acute (Fig. 60) *badia*

KEY TO THE SPECIES OF SATHROBROTA BASED UPON THE SEVENTH ABDOMINAL SEGMENT OF THE FEMALE

1. Posterior margin of seventh sternite emarginate (Fig. 117) *rileyi*
 Posterior margin of seventh sternite convex (Fig. 118) *badia*

***Sathrobrotia rileyi* Walsingham, new combination**
 (Figs. 59, 117, 169)

Batrachedra rileyi Walsingham, 1882. Trans. American Ent. Soc., 10: 198. Dyar, 1902 [1903]. List of the Lepidoptera of North America, Bull. U. S. Natl. Mus., 52: 534.

Pyroderces rileyi, Durrant, 1912. Bull. Ent. Res., 3: 207, f. 3. (*partim*). Busck, 1917. Jour. Agric. Res., 9: 365, ff. 7 B, 8 E. (*partim*). Heinrich, 1921. Jour. Agric. Res., 20: 820. (*partim*). Forbes, 1923. Lepidoptera of New York and neighboring states,

Cornell Univ. Agric. Exp. Sta. Mem., 68:327. (*partim*). McDunnough, 1939. Mem. S. California Acad. Sci., 2: 64.

Tongue pale buff-white basally, yellow distally. Labial palpi white with tinge of buff; second segment with a broad tawny band on outer surface at one-fifth, a tawny annulation at three-fifths, apex tawny; third segment with three brown annulations: one postbasal, one medial, and one preapical. Antennae: pecten brown, scape buff-white with tawny dusting on dorsal surface, apex of scape pale, shaft white to buff-white ventrally and on distal half of each segment dorsally. Face buff-white, vertex pale tawny. Thorax pale buff-white overlaid with tawny. Forewings buff-white heavily overlaid with tawny, overlaid with fuscous on costal half of wing; a transverse series of black scales at one-fourth, another at one-half; an oblique brown streak in costal cilia before apex; two short brown lines forming an angle in dorsal cilia, apex of angle at apex of wing; cilia pale buff-brown. Hindwings fuscous-brown, cilia paler. Abdomen buff-white dorsally, cream-white ventrally. Metathoracic tibiae brown on outer surface; a short oblique white patch from ventral surface at base; an oblique white streak at one-half, interrupted dorsally by brown scales; apex white; middle portion of tibial spurs black; tarsal segments buff-white with brown basally on dorsal surface.

Male genitalia: (Fig. 59) R.W.H. slide no. 915.

Female genitalia: (Fig. 117) R.W.H. slide no. 1033.

Alar expanse: 9–12 mm.

Food plant: scavenger, recorded from the following materials: rotten cotton bolls, cotton seed, corn, Milo maize, stems of corn, corn husks, flowers of castor bean, flower heads of *Mesosphaerum rugosum*.

Type: British Museum (Natural History).

Type locality: Savannah, Georgia.

Specimens examined: 19 ♂, 19 ♀. ARIZONA: Yuma, Webster Co., 2 ♂, 3 ♀, reared from Milo maize, emerged October 10, 1922 (V. L. Wildermuth), [USNM]. ARKANSAS: Center Point, 2 ♂, 11–19 and 11–25, 1915 (C. M. Packard), [USNM]. GEORGIA: Columbus, 2 ♀, February 9 and March 29, 1915 [USNM]; Thomasville, 2 ♂, bred from cotton seed, no date (G. D. Smith), [USNM]. LOUISIANA: Baton Rouge, 3 ♂, 1 ♀, on corn, emerged September 15 through October 15, 1894 [USNM]; Monroe, 1 ♂, 1 ♀, from old cotton boll, emerged October 22 and 23, 1900 [USNM, RWH]. MARYLAND: Washington, 2 ♂, 4 ♀, no date (A. Busck), [USNM]. MISSISSIPPI: Batesville, 1 ♂, 1 ♀, 1–2–1915 [USNM]; Greenwood, 1 ♀, June 16, 1915 (J. M. Langston), [USNM]. TEXAS: Beeville, 1 ♂, issued

from cotton bolls, November 21, 1895 [USNM]; Beeville, 1 ♂, corn husks, emerged September 13, 1895 [USNM]; Beeville, 2 ♀, April 25, 1896 [USNM, RWH]; Columbia, 2 ♀, from rotten cotton bolls, emerged December 25, 1879 (E. A. Schwarz), [USNM]; Corpus Christi, 1 ♂, September 21, 1943 (W. M. Gordon), [CU]; Smith Point, 1 ♂, from old bolls of cotton, emerged October 17, 1923 (L. J. Bottimer), [USNM]; Smith Point, flower heads of *Mesosphaerum rugosum*, emerged October 18, 1923 (L. J. Bottimer), [USNM]; Welasco, 1 ♀, reared from flowers of castor bean, emerged August 30, 1952 (P. T. Riherd), [USNM].

The characters given in the keys will serve to distinguish between *rileyi* and *S. badia*.

***Sathrobrota badia*, new species**

(Figs. 60, 118, 170)

Pyroderces rileyi Busck, 1917. Jour. Agric. Res., 9: pl. 8, f. D. (misidentification.)

Tongue pale buff-white basally, yellow distally. Labial palpi white with tinge of buff; second segment with a broad tawny band on outer surface at one-fifth, a tawny annulation at three-fifths, apex tawny; third segment with three brown annulations: one postbasal, one medial, and one preapical. Antennae: pecten brown, scape buff-white with tawny dusting on dorsal surface, apex of scape pale, shaft white to buff-white ventrally and on distal half of each segment dorsally. Face buff-white, vertex pale tawny. Thorax pale buff-white overlaid with tawny. Forewings heavily overlaid with tawny; costa fuscous to one-half; pattern composed of black tipped scales preceded or followed by buff-white scales; a few black scales on costal margin at one-eighth; a broken transverse row of black scales at one-fourth, not reaching costal or dorsal margin; a subtriangular to quadrate patch of blackish scales at one-half in center of wing; a subcostal series of black scales from three-fifths to four-fifths; a row of dark brown scales along outer margin from tornus to apex of wing; a short brown cross at apex; cilia gray-brown. Hindwings fuscous. Abdomen buff-brown with lavender reflections dorsally, cream-white with some gray ventrally. Metathoracic tibiae tawny on basal two-fifths of outer surface, an oblique white streak from middle tibial spur, outer surfaces of distal half of tibiae dark brown, apex pale buff-white, tibial spurs white or pale buff-white with black at middle; tarsal segments dark brown basally

on dorsal surface, pale apically.

Male genitalia: (Fig. 60) R.W.H. slide no. 1031.

Female genitalia: (Fig. 118) R.W.H. slide no. 595.

Alar expanse: $7\frac{1}{2}$ – $11\frac{1}{2}$ mm.

Food plant: scavenger, recorded from the following materials: pine cones infested by *Dioryctria* (Lepidoptera: Pyralidae), rust infected cones of *Pinus elliottii*, *Pinus palustris*, pods of *Cassia occidentalis*, peach mummy, mummy fossil of loquat, limes, grapefruit, bananas, cabbage, blossoms of cocoanut, and elm leaves.

HOLOTYPE: ♀. So. FLORIDA, in pine cones infested by *Dioryctria*, emerged June 16, 1931 (J. K. Small), [USNM Type No. 66083].

PARATYPES: same data as type, 3 ♂, 1 ♀, June 16–18, 1931 [USNM, RWH]; Santa Ana, Orange So., CALIFORNIA, 27 ♂, 28 ♀, reared from peach mummy, collected March 26, 1943, emerged April 1–16, 1943 (H. H. Keifer), [CAS, RWH, JAP]; Costa Mesa, California, 1 ♀, reared from peach mummy, collected November 10, 1942, emerged December 16, 1942 (Gammon), [CAS]; Cocoanut Grove, FLORIDA, 2 ♂, 4 ♀, from blossoms of cocoanut, May 16–23, 1916 (H. M. Matheson), [USNM, CU]; Miami, Dade Co., Florida, 6 ♂, 4 ♀, mummy fossil of loquat, July 1, 1910 [USNM]; Siesta Key, Sarasota Co., Florida, 10 ♂, 6 ♀, January 2 through May 11 (C. P. Kimball), [CPK, RWH, BMNH]; Archbold Biological Station, Highlands Co., Florida, 1 ♂, 1 ♀, April 2 and 4, 1959 (R. W. Hodges), [RWH]; WASHINGTON, D. C., 2 ♂, 2 ♀, reared from *Pinus palustris*, June 28 and July 14, 1917 (G. G. Hedgecock), [USNM, RWH]; Great Falls, VIRGINIA, 1 ♂, elm leaves, July 17, 1916 [USNM].

Other specimens examined: Mobile, ALABAMA, 1 ♀, April 19, 1922 (Dukes), [USNM]; Lake Alfred, FLORIDA, 1 ♂, larva in pod of *Cassia occidentalis*, August 9, 1929 (L. J. Bottimer), [USNM]; Matheson's Key, 1 ♂, 2 ♀, limes, May 1918 (G. F. Meznette), [USNM]; Osceola Natl. Forest, Baker Co., Florida, 1 ♂, reared from rust infected cones of *Pinus elliottii*, June 28, 1957 (E. P. Merkel), [USNM]; Palmetto, Florida, 1 ♀, cabbage, June 12, 1945 [USNM]; Royal Palm State Park, Florida, 1 ♀, no date (F. M. Jones), [USNM]; 3 miles S. Clarcona, Florida, bred from grapefruit, emerged September 25–30, 1930 (F. H. Benjamin), [USNM]; Siesta Key, Sarasota Co., Florida, 2 ♂, 5 ♀, December 1 through April 19 (C. P. Kimball), [CPK]; Boothville, LOUISIANA, 5 ♀, *ex* bananas, March 8, 1945 [USNM].

LIMNÆCIA Stainton
(Figs. 1, 12, 63, 121)

- Type: *Limnaecia phragmitella* Stainton, 1851. Monobasic.
- Limnaecia* Stainton, 1851. Suppl. Cat. Brit. Tineina, 4. Wocke, in Heinemann, 1877 [1876]. Die Schmetterling Deutschlands und der Schweiz, 2: 421. Staudinger and Rebel, 1901. Catalog der Lepidopteren des Palaearctischen Faunengebiets, pt. 2: 187. Spuler, 1910. Schmetterlinge Europas, 2: 384, f. 142. Forbes, 1923. Lepidoptera of New York and neighboring states, Cornell Univ. Agric. Exp. Sta. Mem., 68: 324, ff. 181, 194. Fletcher, 1928. Catalogue of Indian Insects, pt. 16: 18. Fletcher, 1929. Mem. Dept. Agric. in India, Ent. Ser., 11: 127. Diakonoff, 1954. Verh. Akad. Wet. Amsterdam, 50, no. 1: 74.
- Laverna* Stainton, 1854. Insecta Britannica. Lepidoptera: Tineina, 238. (*partim*.)
- Limnoecia* Meyrick, 1888. Trans. New Zealand Inst., 172. (emendation). Busck, 1901. Proc. Ent. Soc. Washington, 4: 421.
- Anybia* Meyrick, 1928. Revised Handbook of British Lepidoptera, 652. (incorrect association). Fletcher, 1928. Catalogue of Indian Insects, pt. 16: 19. (as synonym of *Limnaecia*.) Fletcher, 1929. Mem. Dept. Agric. in India, Ent. Ser., 11: 17, 127. (as synonym of *Limnaecia*.)
- Lymnaecia* Dyar, 1902 [1903]. List of the Lepidoptera of North America, Bull. U. S. Natl. Mus., 52: 537. McDunnough, 1939. Mem. S. California Acad. Sci., 2: 64.

The synonymy given by Fletcher (1928) and cited with doubt by Diakonoff (1954) is not repeated. Study of the type species involved should be made before the list is accepted.

Head smooth-scaled; tongue scaled, well developed; maxillary palpi folded over base of tongue, slightly drooping; labial palpi recurved, reaching well beyond vertex, smooth-scaled, third segment longer than second, apex acute; antennae two-thirds to four-fifths, pecten present, ciliate in male, simple in female.

Forewings narrow, elongate, apex acute; 12 veins present; 1b furcate basally; 2 from two-thirds on cell; 2, 3, and 4 equidistant; 7 and 8 stalked; 10 from three-fourths on cell; 11 from two-fifths on cell. Hindwings narrow, elongate, apex acute; 8 veins present; 2 from three-fifths on cell; 2, 3, 4, and 5 equidistant; 5, 6, and 7 approximate; 6 and 7 diverging.

Male genitalia: *valvae* asymmetrical; costal area separate or heavily sclerotized and connected to valva; *aedeagus* short, anky-

losed, basal process present; arms of *gnathos* separate, left *brachium* larger than right one, heavily sclerotized.

Female genitalia: *bursa copulatrix* membranous; *signa* present; *lamellae vaginales* forming a long heavily sclerotized tube; *apophyses anteriores* broad, heavily sclerotized; *apophyses posteriores* sinuate distally.

One species of *Limnaecia* is known to occur within the region considered by this paper; and it is reported by Meyrick (1928) to be found in Europe, North Africa, Australia, and New Zealand. He believed that it has been dispersed in the larval stage by being blown with the down of *Typha*, the food plant of the larva.

***Limnaecia phragmitella* Stainton**

(Figs. 63, 121, 171)

Limnaecia phragmitella Stainton, 1851. Suppl. Cat. Brit. Tineina, 4. Spuler, 1910. Schmetterlinge Europas, 2: 384, pl. 89, f. 66. Forbes, 1923. Lepidoptera of New York and neighboring states, Cornell Univ. Agric. Exp. Sta. Mem., 68: 324.

Laverna phragmitella Stainton, 1854. Insecta Britannica. Lepidoptera: Tineina, 238. Stainton, 1870. Natural History of the Tineina, 11: 150-159, pl. 4.

Limnoecia phragmitella, Meyrick, 1895. Handbook of British Lepidoptera, 675. Busek, 1901. Proc. Ent. Soc. Washington, 4: 421.

Lymnaecia phragmitella, Dyar, 1902 [1903]. List of the Lepidoptera of North America, Bull. U. S. Natl. Mus., 52: 537. Claassen, 1921. Typha Insects, Cornell Univ. Agric. Exp. Sta. Mem., 47: 487. McDunnough, 1939. Mem. S. California Acad. Sci., 2: 64.

Tongue buff, apical one-third very lightly scaled. Labial palpi buff-white, a few pale brown scales on dorsolateral surface of first segment, second segment with a few pale brown scales subbasally and subapically, third segment with an internal and an external brown line. Antennae buff, ventral surface of scape with a few pale brown scales at base, scape with an anterior brown line continued on shaft as a series of dots to one-half. Face and vertex buff-brown. Forewings buff-brown with a medial brown spot at one-third, another brown spot at two-thirds, four or five pale brown spots on costal margin on apical one-third, a faint pale brown spot on dorsal margin near vertex, a pale brown spot on fold at two-thirds, internal brown spots encircled or partially bordered by white scales, costal spots bordered internally by white scales, a gray

streak from inner medial dot to apex complete or partially developed, cilia shining buff. Hindwings gray-brown, cilia buff. Abdomen buff dorsally, buff-white ventrally. Legs buff to buff-brown, prothoracic tibiae gray-brown with a dorsal buff line.

Male genitalia: (Fig. 63) R.W.H. slide no. 597.

Female genitalia: (Fig. 121) R.W.H. slide no. 3.

Alar expanse: 15–20 mm.

Food plant: *Typha latifolia* L. and *T. angustifolia* L. Claassen (1921) gives the following discussion of the habits of the immature stages:

“The larvae restrict their work to the head of the plant, except occasionally when they bore into the stem to transform. The young larvae feed on the tender styles of the pistillate flowers, but as these grow larger and become dry, the larvae move farther inward and eat the seeds of the plant. As cold weather approaches, they migrate still farther inward, and finally locate near the rachis of the flower spike, where they often eat away the basal part of the little stalks which bear the seeds. The larvae spin an abundance of silk with which they tie the down, or pappus, together, thus keeping it from being torn off or blown away.

“The cat-tail heads which are infested by these larvae present a striking appearance. The silk spun by the larvae holds the downy material together and does not allow the seeds to escape, but the heads fluff out. . . .

“The larvae overwinter in the half-grown stage in the head of the plant, the fluffy material of the fruiting spike being their protection.

“In the latter part of May or early June the larvae attain their full growth. Then, in the midst of the downy material, the larvae spin their thin, tough, white cocoons and transform to the pupal stage. Many of the larvae, leaving the heads, go down and bore into the stem of the cat-tail plant, forming burrows which they line with silk; and there they pupate.”

Type: British Museum (Natural History).

Type locality: ? England.

Specimens examined: 100 ♂, 108 ♀. COLORADO: Watkins, Adams Co., 4 ♂, July 4 and 5, 1927 [CU]; Fort Collins, 1 ♀, July 19, 1930 (A. B. Klots), [ABK]; Fountain Valley School, Colorado Springs, 1 ♂, July 12–19, 1932 (A. B. Klots), [ABK]. ILLINOIS: Arlington Hts., 1 ♂, July 10, 1930 (A. L. McElhose), [CNHM]; Putnam Co., 3 ♂, 5 ♀, June 20 through July 25 (M. O. Glenn), [MOG, CNHM, INHS]. MARYLAND: Berwyn, 2 ♀, September 2, 1913 (P. L.

Boone), [USNM]; Twining, 1 ♀, October 1, 1899 (A. Busck), [USNM]; Washington, D. C., 10 ♂, 3 ♀, June through September 30 (A. Busck), [USNM, MCZ]. MASSACHUSETTS: Martha's Vineyard, 2 ♂, 6 ♀, July 25 through August 6 (F. M. Jones), [USNM, CPK]; Barnstable, 1 ♀, July 14, 1954 (C. P. Kimball), [CPK]; Nantucket, 1 ♀, July 19, 1945 (C. P. Kimball), [CPK]; Watertown, 1 ♀, on *Typha* sp., emerged May 7, 1921 (W. O. Ellis), [USNM]. MICHIGAN: Bath, Clinton Co., 9 ♂, 12 ♀, reared *ex Typha*, emerged June 25 through July 9, 1958 (R. W. Hodges), [RWH]; Isle Royale, Keweenaw Co., 1 ♂, July 27, 1957 (R. W. Hodges), [RWH]; Midland Co., 1 ♂, June 30, 1941 (R. R. Dreisbach), [CU]. NEW JERSEY: Anglesea, 1 ♂, no date or collector [MCZ]; Montclair, 7 ♂, 3 ♀, June 25 through July 10 (W. D. Kearfott), [USNM]; Newark, 3 ♂, 2 ♀, July 13 (A. J. Weidt), [USNM]; Oakland, 1 ♀, August 21, 1948 (C. P. Kimball), [CPK]; Short Hills, 1 ♂, 4 ♀, July 1, 1888 (Beutenmueller), [CU, USNM, MCZ]. NEW YORK: Buffalo, 1 ♂, July 2, 1905 [CU]; East Aurora, 1 ♀, July 20, 1912 [CU]; Hion, 1 ♀, July 3, 1912 (H. McElhose), [CNHM]; Irving, 1 ♀, July 22, 1917 [CU]; Ithaca, 14 ♂, 12 ♀, June 26 through August 8 [CU]; Six Mile Creek, Ithaca, 1 ♀, August 10, 1956 (J. G. Franclemont), [JGF]; McLean Bogs Reserve, Tompkins Co., 1 ♂, 23 ♀, July 17–22 (J. G. Franclemont), [CU, JGF]; Mattituck, Long Island, 1 ♂, July 6, 1933 (Roy Latham), [CU]; Minetto, Oswego Co., 5 ♂, 1 ♀, June 22–24, 1938 (W. T. M. Forbes), [CU]; New Windsor, 1 ♀, no date given [USNM]; Orient, Long Island, 3 ♂, 1 ♀, May 12 through June 16, 1934 and September 9, 1934 (Roy Latham), [CU]; North Collins, 10 ♂, 10 ♀, June 27 and 28, 1938 (W. T. M. Forbes), [CU]; Riverhead, Long Island, 1 ♀, July 1, 1934 (Roy Latham), [CU]; Rochester, 1 ♀, July 8, 1933 (A. B. Klots), [ABK]. OHIO: Cincinnati, 1 ♂, reared, emerged June 10, 1922 (Annette F. Braun), [CAS]. PENNSYLVANIA: Germantown, 1 ♂, June 21 [MCZ]; Hazelton, 5 ♂, 1 ♀, June 8 through 24 (Dietz), [USNM, MCZ]; Mt. Airy, 1 ♂, 1 ♀, June 25 [USNM, MCZ]; Oak Station, Alleghany Co., 3 ♂, June 25 through July 1 (Fred Marloff), [USNM, CNHM]. ONTARIO: Charlton, 1 ♀, July 25, 1932 (H. S. Parish), [CU]; Geraldton, 1 ♀, July 14–19, 1955 (A. B. Klots), [ABK]; Ottawa, 1 ♂, July 4, 1925 (C. H. Curran), [CNC]; Ottawa, 1 ♀, July 14, 1931 (C. H. Young), [CNC]; Toronto, 1 ♀, June 1, 1931 (H. S. Parish), [CU]; Trenton, 1 ♀, July 16, 1907 (Evans), [USNM]. QUEBEC: St. Johns, 1 ♀, July 1, 1915 (W. Chagnon), [USNM].

Comparison with the illustration of the wings of *L. phragmitella*

(Fig. 171) should suffice to separate this species from the other cosmopterigids.

This species appears to be very local and usually does not fly far from its breeding area.

TELADOMA Busck
(Figs. 9, 14, 61, 120)

Type: *Teladoma helianthi* Busck, 1932. Original designation. *Teladoma* Busck, 1932. Proc. Ent. Soc. Washington, 34:17. McDunnough, 1939. Mem. S. California Acad. Sci., 2:63.

Head smooth-scaled; tongue short, scaled; labial palpi smooth-scaled, recurved, reaching vertex, slightly tufted on ventral surface of second segment, second segment longer than third, apex of third segment acute; antennae one-half to two-thirds, pecten present, composed of many scales, ciliate in male, simple in female. Dorsal surface of mesothoracic and metathoracic tibiae with long scales.

Forewings lanceolate; 10 veins present; 1b furcate basally; 2 and 3 absent; 4 and 5 connate; 7 and 8 stalked, 7 to costa; 11 from middle of cell. Hindwings sublanceolate to linear; 8 veins present; 1 weak; 2, 3, and 4 arising equidistant; 6 and 7 parallel basally, slightly diverging distally.

Male genitalia: *aedeagus* linear; *cornuti* absent; *aedeagus* armed externally with a large spine; *tegumen* heavily sclerotized with lateral lobes; arms of *gnathos* fused to form a spine; *uncus* and *socii* absent.

Female genitalia: *lamellae vaginales* united to form a projecting tube; *signa* absent; *ductus bursae* not sclerotized; *apophyses anteriores* united at base.

Paratheta astigmatica Meyrick is transferred to *Teladoma* on the basis of a male paratype in the United States National Museum, and two new species are described, bringing the number of species known from North America north of Mexico to four. There is a specimen of another new species in the Cornell Collection; however, its condition is too poor to warrant description. The distribution records of the known species indicate that the genus has its center of distribution in the Midwest and Southwest with a probable extension into Sonora and Chihuahua.

KEY TO THE SPECIES OF TELADOMA BASED UPON THE MACULATION

- | | |
|------------------------------|---|
| 1. Forewings buff-gray | 2 |
| Forewings gray | 3 |

2. Hindwings brown; discal spot of forewings absent *astigmatica*
 Hindwings gray to gray-brown; discal spot of forewings
 present *helianthi*
3. Hindwings sublanceolate; tendency to have spots above fold
 on forewings (Fig. 174) *murina*
 Hindwings linear; no tendency to have spots on forewings *incana*

KEY TO THE SPECIES OF TELADOMA BASED UPON THE MALE GENITALIA

1. Lateral projections of tegumen asymmetrical 2
 Lateral projections of tegumen symmetrical (Fig. 65)
 *astigmatica*
2. Gnathos slender, apex recurved 3
 Gnathos stout, apex straight (Fig. 61) *helianthi*
3. Projection on left side of tegumen single (Fig. 64) *incana*
 Projection on left side of tegumen double (Fig. 66) *murina*

Teladoma helianthi Busck

(Figs. 61, 120, 172)

Teladoma helianthi Busck, 1932. Proc. Ent. Soc. Washington, 34:

17. McDunnough, 1939. Mem. S. California Acad. Sci., 2: 63.

Head, thorax, and forewings covered with light gray scales with flecks of darker gray on them. Labial palpi short, apex of second segment gray. Forewings generally unicolorous, costal margin darker, sometimes with a dark gray spot above end of fold. Hindwings gray. Abdomen gray-brown dorsally, pale gray ventrally. Legs pale gray basally, dark gray distally; metathoracic tibiae with dense covering of long pale scales dorsally; apices of tarsal segments pale gray.

Male genitalia: (Fig. 61) A. Busck slide.

Female genitalia: (Fig. 120) A. Busck slide.

Alar expanse: 6-12 mm.

Food plant: *Helianthus* and *Xanthium*.

Type: **Lectotype**, present designation. ♂, East St. Louis, ILLINOIS, reared from sunflower leaves, emerged June 30, 1930 (Satterthwait), [USNM].

Type locality: East St. Louis, Illinois.

Specimens examined: 19 ♂, 11 ♀. CALIFORNIA: San Diego, 1 ♂, July 28, 1923 [LACM]. ILLINOIS: East St. Louis, 14 ♂, 11 ♀, reared from sunflower leaves, emerged June 23 through August 25, 1930

(Satterthwait), [USNM]. OKLAHOMA: Oklahoma City, 3 ♂, August 2–21, 1955 (D. R. Davis), [DRD]. TEXAS: Devers, 1 ♂, June 21, 1917 [CU].

T. helianthi and *T. astigmatica* are similar in respect to maculation; however, the presence of a discal spot in *helianthi* will usually separate them. The stout *gnathos* and asymmetrical projections of the *tegumen* will separate *helianthi* from the other species of *Teladoma*.

***Teladoma astigmatica* Meyrick, new combination**
(Figs. 65, 173)

Paratheta astigmatica Meyrick, 1928. Exot. Micr., 3:467. McDunnough, 1939. Mem. S. California Acad. Sci., 2:77. Clarke, 1941. Proc. U. S. Natl. Mus., 90:39.

Maculation as for *T. helianthi*, the general facies slightly browner than *helianthi*. Labial palpi and distal portion of legs pale gray.

Male genitalia: (Fig. 65) R.W.H. slide no. 979.

Female genitalia: no specimens available.

Alar expanse: 12–12 ½ mm.

Food plant: unknown.

Type: British Museum (Natural History).

Type locality: Bent, 7,000 ft., New Mexico.

Specimens examined: 1 ♂. TEXAS: Fort Davis, 5,000 feet, 1 ♂, "10.27" [USNM].

T. astigmatica can be distinguished from the other species of *Teladoma* by the symmetrical projections of the *tegumen* in the male genitalia.

***Teladoma murina*, new species**
(Figs. 66, 174)

Head, thorax, forewings, abdomen, and legs dark gray. Maculation as for *T. helianthi*. Forewings often with a median gray-brown spot above middle of fold and another above end of fold, a few gray-brown scales at two-thirds on fold.

Male genitalia: (Fig. 66) R.W.H. slide no. 990.

Female genitalia: no specimens available.

Alar expanse: 8–9 ½ mm.

Food plant: unknown.

HOLOTYPE: ♂, Peña Blanca Canyon, Santa Cruz Co., ARIZONA, August 26, 1959 (R. W. Hodges), [CU Type No. 3804].

PARATYPES: same locality as type, 7 ♂, August 24 and 26, 1959 [CU, RWH, USNM].

The mouse-gray color and presence of spots on the forewings will separate *murina* from *T. incana*. In the male genitalia the double projection on the left side of the tegumen will separate *murina* from *incana*.

Teladoma incana, new species

(Figs. 64, 175)

Head, thorax, forewings, abdomen, and legs dark gray. Second segment of labial palpi with a subapical annulation of dark gray followed by paler gray at apex. Forewings immaculate.

Male genitalia: (Fig. 64) R.W.H. slide no. 1005.

Female genitalia: no specimens available.

Alar expanse: 8 mm.

Food plant: unknown.

HOLOTYPE: ♂, Putnam Co., Illinois, July 10, 1959 (M. O. Glenn), [USNM Type No. 66084].

T. incana can be separated from *T. murina* by the lack of markings on the forewings and the narrower hindwings. The single projection on the left side of the *tegumen* and the long slender *gnathos* in the male genitalia will distinguish *incana* from *murina*.

TRICLONELLA Busck

(Figs. 6, 11, 67, 123)

Type: *Triclonella pergandeella* Busck, [1901]. Original designation.

Triclonella Busck, 1900 [1901]. Jour. New York Ent. Soc., 8: 236. Dyar, 1902 [1903]. List of the Lepidoptera of North America, Bull. U. S. Natl. Mus., 52: 525. Kearfott, in Smith, 1903. Check list of the Lepidoptera of Boreal America, 114. Busck, 1908. Proc. U. S. Natl. Mus., 35: 203. Walsingham, 1912. Biologia Centrali-Americana, Lepidoptera-Heterocera, 4: 136. Walsingham, 1915. *ibid.*, 422. Busck, 1914. Proc. U. S. Natl. Mus., 47: 32. Barnes and McDunnough, 1917. Check list of the Lepidoptera of Boreal America, 161. Meyrick, in Wytsman, 1922. Genera Insectorum, 180: 22. Forbes, 1923. Lepidoptera of New York and neighboring states, Cornell Univ. Agric. Exp.

Sta. Mem., 68:249. Fletcher, 1929. Mem. Dept. of Agric. in India, Ent. Ser., 11:230. Busck, 1932. Proc. Ent. Soc. Washington, 34:17. Gaede, *in* Bryk, 1938. Lepidopterorum Catalogus, pt. 88:21. McDunnough, 1939. Mem. S. California Acad. Sci., 2:77. Clarke, 1941. Proc. U. S. Natl. Mus., 90:269.

Head smooth-scaled; tongue scaled, well developed; maxillary palpi folded over base of tongue; labial palpi recurved, slender and smooth scaled, second and third segments subequal in length, apex acute; antennae with pecten, ciliate in male, simple in female.

Forewings elongate, apex rounded or acute; 12 veins present; 1b furcate basally; 2-6 separate; 7 and 8 stalked, 7 to costa before apex; 11 arising before middle of cell. Hindwings elongate, apex rounded or acute, slightly narrower than forewings; 8 veins present; 1b furcate basally; 3 and 4 stalked; 5 connate or approximate to 3+4; 6 and 7 arising parallel, diverging distally, 7 to costal margin before apex.

Male genitalia: *valvae* lobate with a costal process arising near base, inner faces with long setae; *juxta* weakly developed; *tegumen* heavily sclerotized; *aedeagus* long, cylindrical; *cornuti* present or absent; *uncus* and *socii* absent; *brachia* asymmetrical, subequal in length.

Female genitalia: *lamella antevaginalis* heavily sclerotized, asymmetrical; *ductus bursae* sclerotized or not; *bursa copulatrix* lightly sclerotized; *signum* absent; *apophyses anteriores* shorter than apophyses posteriores.

Busck (1901) proposed *Triclonella* for *pergandeella* and *villella*, and he placed the genus in the Oecophoridae. In 1908 he transferred *villella* to *Holcocera* in the Blastobasidae and at the same time transferred *determinatella* from *Oecophora* to *Triclonella*, and in 1932 he transferred *Triclonella* from the Oecophoridae to the "Cosmopterygidae." Clarke (1941) confirmed Busck's transfer of the genus to the "Cosmopterygidae" and transferred *antidectis* from *Epicallima* to *Triclonella*. In the present paper two new species of *Triclonella* are described, bringing to five the number of species recognized as occurring in North America north of Mexico.

KEY TO THE SPECIES OF TRICLONELLA BASED UPON THE MACULATION

1. Base of forewings yellow-ocher 2
Base of forewings dark brown 4
2. Outer third of forewings gray to black 3
A costal and a dorsal gray triangle at one-half, followed by an orange-brown patch of scales (Fig. 177) *antidectis*

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3. A small patch of brown scales at three-fourths *xuthocelis*
 No brown scales on outer third *pergandeella*
4. Basal fourth of forewings dark brown *determinatella*
 A few rows of brown to orange-brown scales at base of forewings
 bicoloripennis

KEY TO THE SPECIES OF TRICLONELLA BASED UPON THE MALE GENITALIA

1. Cornuti present in vesica of aedeagus 2
 Cornuti absent in vesica of aedeagus 4
2. Two or more cornuti 3
 With a single cornutus *antidectis*
3. Two cornuti, one medial and one distal (Fig. 67) *pergandeella*
 Four or five cornuti, three or four postmedial and one distal
 (Fig. 68a) *xuthocelis*
4. Valvae with a distinct shoulder in saccular area (Fig. 70)
 determinatella
 Valvae without a distinct shoulder in saccular area (Fig. 71)
 bicoloripennis

KEY TO THE SPECIES OF TRICLONELLA BASED UPON THE FEMALE GENITALIA

1. Ductus bursae sclerotized (Fig. 123) 2
 Ductus bursae not sclerotized (Fig. 124) *determinatella*
2. Ductus bursae evenly sclerotized 3
 One side of ductus bursae more heavily sclerotized (Fig. 123)
 pergandeella
3. Ductus bursae broad at posterior extremity (Fig. 122) *antidectis*
 Ductus bursae narrow before juncture with lamella antevagi-
 nalis (Fig. 125) *xuthocelis*

Triclonella pergandeella Busck (Figs. 67, 123, 176)

Triclonella pergandeella Busck, 1900 [1901]. Jour. New York Ent. Soc., 8: 237. Dyar, 1902 [1903]. List of the Lepidoptera of North America, Bull. U. S. Natl. Mus., 52: 525. Busck, 1908. Proc. U. S. Natl. Mus., 35: 203. Barnes and McDunnough, 1917. Check list of the Lepidoptera of Boreal America, 161. Meyrick, in Wytzman, 1922. Genera Insectorum, 180: 22. Forbes, 1923.

Lepidoptera of New York and neighboring states, Cornell Univ. Agric. Exp. Sta. Mem., 68: 249. Busck, 1932. Proc. Ent. Soc. Washington, 34: 17. McDunnough, 1939. Mem. S. California Acad. Sci., 2: 77. Clarke, 1941. Proc. U. S. Natl. Mus., 90: 269.

Tongue pale brown basally, white distally. Maxillary palpi white ventrally, black dorsally. Labial palpi black; second segment with an anterior lateroventral and an exterior lateroventral white line, dorsal surface dusted with white scales; third segment with an anterior white line, posterior surface dusted with white scales. Antennae black; scape with ventral surface white; an anterior and a posterior white line, each continued on shaft as a series of dots. Face gray-brown, anterior edge of eyes bordered by a row of black scales followed by a few white ones; vertex gray-brown centrally, a fascicle of brown scales above posterior edge of eyes; a row of white scales above each eye. Thorax yellow-ocher. Forewings yellow-ocher on basal two-thirds, followed by a row of white scales, then a dorsal patch of black scales; outer one-third covered with black scales tipped gray; anterior edge of costa gray-brown basally; a patch of white scales above tornus; a row of white scales on costal margin from two-thirds to apex; cilia on outer margin light gray with a few white scales. Hindwings pale gray. Abdomen dark gray, last segment yellow-brown. Legs brown, darker distally; prothoracic tibiae with two anterior white lines; mesothoracic tibiae with a few white scales at apex; metathoracic tibiae with a medial and an apical white annulation, apices of tarsal segments white, base of first tarsal segment white.

Male genitalia: (Fig. 67) R.W.H. slide no. 617.

Female genitalia: (Fig. 123) R.W.H. slide no. 618.

Alar expanse: 10–13 mm.

Food plant: *Desmodium* spp., *Lespedeza hirta* (L.), *Clitoria mariana* L. The habits of the larva are quoted from Busck (1901):

"The larva feeds on the common tick-trefoil, *Meibomia* [*Desmodium*] *dillenii*. . .

"The eggs are laid singly on the underside of a leaflet and the larva lives in a roomy inclosure between two leaflets spun together. When full grown it is about 12 mm. long, cylindrical, slightly depressed and tapering fore and back. . . . When younger, the larva is of a much lighter appearance, the yellow predominating. It is very agile and runs quickly forwards or backwards and lets itself fall on a silken thread, if the leaves are not carefully handled. When ready to pupate it enlarges its cell by adding the third leaflet, and suspended by a slight web a thin white half-transparent

oval cocoon is spun inside the cell, in which the larva transforms to a rather robust light brown pupa.

"There are two or three overlapping generations yearly in this locality, the moth issuing late in June and late in August and sometimes again late in September.

"The species over-winter as imago."

Type: United States National Museum.

Type locality: District of Columbia.

Specimens examined: 30 ♂, 9 ♀. ALABAMA: Camp Rucker, Ozark, 4 ♂, March 25-28, 1943 (J. G. Franclemont), [CU]. FLORIDA: Gainesville, 1 ♂, March 9, 1927 (D. M. Bates), [UM]; Lake Alfred, 1 ♀, May 29, 1929 (L. J. Bottimer), [USNM]; Winter Haven, 2 ♂, under rearing record B. 128, on *Clitoria fragrans*, emerged July 26 and 28, 1929 (L. J. Bottimer), [USNM]. KENTUCKY: Natural Bridge, 2 ♂, May 18, 1929 (Annette F. Braun), (RWH); Pine Mt., Letcher Co., 1 ♂, 2 ♀, under rearing record B. 1370, emerged July 1 and 5, 1933 (Annette F. Braun), [AFB]; Pine Mt., Harlan Co., 1 ♀, under rearing record B. 1370, emerged July 22, 1932 (Annette F. Braun), [AFB]; Pine Mt., Bell Co., 1 ♂, under rearing record B. 1370, emerged July 22, 1937 (Annette F. Braun), [AFB]. MARYLAND: Washington, D. C., 11 ♂, 5 ♀, reared from *Desmodium*, emerged June 30 through August 25 (A. Busck), [USNM, MCZ, CU]; Forest Glen, 1 ♀, July 16, 1914 (O. Heide-man), [USNM]; Hyattsville, 1 ♂, August 1906 (Aug. Busck), [LACM]. NORTH CAROLINA: Highlands, Macon Co., 1 ♂, July 15, 1958 (R. W. Hodges), [RWH]; Southern Pines, 1 ♂, "1-7:IV" [MCZ]. SOUTH CAROLINA: Cherry Hill Recreation Area, Route 107, 2000 feet, Oconee Co., 1 ♂, September 4, 1958 (R. W. Hodges), [RWH]. TENNESSEE: Monteagle, 3 ♂, August 31, 1929 and August 20, 1930 (Richards), [CU]. TEXAS: [Dallas], 1 ♂, April 23 (Boll), [USNM].

T. pergandeella can be distinguished from *T. xuthocelis* by the absence of brown scales in the outer third of the forewings. The presence of two *cornuti* in the *vesica* of the *aedeagus* of the male genitalia will separate it from *xuthocelis* which has four or five *cornuti* in the *vesica*.

Triclonella xuthocelis, new species

(Figs. 68, 68a, 125, 177)

Tongue white. Maxillary palpi white ventrally, black dorsally. Labial palpi black; second segment with an interior lateroventral and an exterior lateroventral white line, dorsal surface dusted with

white scales; third segment with an anterior white line, posterior surface dusted with white scales. Antennae black, scape with ventral surface white and with an anterior and a posterior white line, each continued on shaft as a series of dots. Face gray, anterior edge of eyes bordered by a row of black scales followed by a few white ones, vertex gray centrally, a fascicle of brown scales above posterior edge of eyes, a row of white scales above each eye. Thorax yellow-ocher. Forewings yellow-ocher from base to two-thirds, outer third composed of gray scales tipped with black, a row of white scales on dorsal half at point of contact of two colored areas, then a small area of black scales, a small patch of yellow-brown scales at three-fourths preceded by some scattered white scales, cilia on outer margin pale gray. Hindwings gray. Abdomen shining gray; male with a few whitish scales from margin of eighth tergite. Legs gray basally; prothoracic and mesothoracic legs black distally with two dorsal white lines on tibiae; metathoracic tibiae gray with three oblique white streaks: one from base, one at one-half, and one apical; tarsal segments pale gray, apices white, base of first segment white.

Male genitalia: (Figs. 68, 68a) R.W.H. slide nos. 616 and 583.

Female genitalia: (Fig. 125) R.W.H. slide no. 584.

Alar expanse: 13–16 mm.

Food plant: unknown.

HOLOTYPE: ♂, Madera Canyon, 4880 feet, Santa Rita Mountains, Santa Cruz Co., ARIZONA, August 27, 1959 (R. W. Hodges), [CU Type No. 3802].

PARATYPES: same locality as type, 96 ♂, 82 ♀, June 30 through September 23, 1959 [CU, RWH, USNM, BMNH, LACM, CAS, AFB]; same locality as type, except elevation, 5,600 feet, 1 ♂, September 3, 1959 [RWH]; Southwest Research Station of AMNH, Cave Creek Canyon, 5400 ft., Chiricahua Mts., Cochise Co., ARIZONA, 1 ♂, June 16, 1958 (J. M. Burns and S. N. Burns), [UCB].

There are 24 poor specimens from Madera Canyon. These are not included among the paratypes.

T. xuthocelis can be separated from *T. pergandeella* by the characters stated under *pergandeella*. Superficially, *xuthocelis* is closest to *T. xanthota* Walsingham described from Amula, Guerrero, Mexico. Mr. Bradley has compared some of the material of *xuthocelis* with the type of *xanthota*. He feels that they are close but distinct. He states concerning the female genitalia, "They are very similar: there is little difference in the *ostium*: there is a difference in the sclerotization in the *ductus bursae* (*cestum*), in *xanthota* it is not broadened and expanded as it curves before inception of the *bursa copulatrix*."

This species came commonly to "black light" during the summer of 1959; however, it was noted that almost all of the specimens were taken at a light which was near the probable breeding area. A light situated about one-hundred-fifty feet farther from the area attracted few specimens. It would seem that Busck's (1901) earlier hypothesis about the flight habits of *T. pergandeella* holds for another species in the genus.

***Triclonella antidectis* Meyrick**

(Figs. 69, 122, 178)

Epicallima antidectis Meyrick, 1914. Exot. Micr., 1: 218. Barnes and McDunnough, 1917. Check list of the Lepidoptera of Boreal America, 161.

Schiffermulleria antidectis, McDunnough, 1939. Mem. S. California Acad. Sci., 2: 77.

Triclonella antidectis, Clarke, 1941. Proc. U. S. Natl. Mus., 90: 270.

Tongue white. Maxillary palpi white ventrally, black dorsally. Labial palpi black; second segment with an interior lateroventral and an exterior lateroventral white line, dorsal surface dusted with white scales; third segment with an anterior white line, posterior surface dusted with white scales. Antennae black; ventral surface of scape white; scape with an anterior white line continued on shaft to one-half; segments of distal half of shaft white on basal half, black on distal half. Face gray-brown, a row of white scales before eyes. Thorax yellow-ocher. Forewings concolorous with thorax to one-half, followed by a costal and a dorsal gray triangle, sometimes meeting to form a fascia; a row of brown scales along costal margin followed, medially, by a row of white and then a row of brown scales; a costal patch of white to buff scales beyond gray triangular area; rest of costal third of wing orange-brown; cilia paler than apical area; becoming gray at tornus. Hindwings pale gray. Abdomen dark gray dorsally, buff on medial portion of ventral surface. Legs pale gray basally; prothoracic legs black distally, two white lines on dorsal surface of tibiae, apices of first, second, third, and fifth tarsal segments white; mesothoracic legs dark gray-brown distally with some areas of white; metathoracic legs buff-white distally.

Male genitalia: (Fig. 69) R.W.H. slide no. 533.

Female genitalia: (Fig. 122) R.W.H. slide no. 534.

Alar expanse: 11-12 $\frac{1}{2}$ mm.

Food plant: unknown.

Type: British Museum (Natural History).

Type locality: Nogales and Patagonia Mts., Arizona.

Specimens examined: 13 ♂, 2 ♀. ARIZONA: Nogales, 1 ♂, "6·03" [USNM]; Madera Canyon, 4,880 feet, Santa Rita Mountains, Santa Cruz Co., 9 ♂, 2 ♀, July 14 through August 9, 1959 (R. W. Hodges), [CU, RWH]; same locality, 5,600 feet, 1 ♂, July 30, 1959 [RWH]; Patagonia Mts., 1 ♂, "4·03" [USNM]; Redington, 1 ♂, [USNM].

T. antidectis can be separated from the other species of *Triclonella* by the three rows of scales which are brown, white, then brown, along the costal margin of the forewings.

***Triclonella determinatella* Zeller**

(Figs. 70, 124, 179)

Oecophora determinatella Zeller, 1873. Verh. zool-bot. Ges. Wien, 23: 289. Chambers, 1878. Bull. U. S. Geol. Geog. Surv. Terr., 4: 159. Dyar, 1902 [1903]. List of the Lepidoptera of North America, Bull. U. S. Natl. Mus., 52: 525.

Triclonella determinatella, Busck, 1908. Proc. U. S. Natl. Mus., 35: 203. Forbes, 1923. Lepidoptera of New York and neighboring states, Cornell Univ. Agric. Exp. Sta. Mem., 68: 249. McDunnough, 1939. Mem. S. California Acad. Sci., 2: 77. Clarke, 1941. Proc. U. S. Natl. Mus., 90: 270.

Oecophora australisella Chambers, 1875. Cincinnati Quart. Jour. Sci., 2: 114. Chambers, 1877. Can. Ent., 9: 24.

Tongue gray-brown basally, pale gray distally. Maxillary palpi brown, a few white scales dorsally. Labial palpi black; second segment with two white lines, one ventrolateral internally and one venterolateral externally, a few white scales at apex on inner surface; third segment with an anterior white line. Antennae black, scape with an anterior and a posterior row of white scales, continued on shaft to apex. Face and vertex dark brown, a few white scales in front of eyes, and a fascicle of white scales above posterior angle of eyes. Thorax dark brown. Forewings brown basally followed by a shining straw colored (some brown) fascia, very pale basally; an irregular gray-black fascia from one-half to three-fourths; then a gray fascia, almost white at costa; a circular patch of shining straw colored scales at two-thirds; apical fourth composed of gray scales tipped with black, pale basally (white on costa), dark apically; cilia gray with black or dark gray flecks. Hindwings pale gray. Abdomen fuscous, last segment with some buff scales. Legs fuscous basally; prothoracic tibiae and tarsi black with a dorsal

white line; metathoracic tibiae with white at base, middle, and apex; tarsi fuscous, paler at apices of segments.

Male genitalia: (Fig. 70) R.W.H. slide no. 1000.

Female genitalia: (Fig. 124) R.W.H. slide no. 924.

Alar expanse: 9 $\frac{1}{2}$ –11 mm.

Food plant: unknown.

Type: Museum of Comparative Zoology.

Type locality: Dallas, Texas.

Specimens examined: 28 ♂, 9 ♀. FLORIDA: Gainesville, 2 ♀, May 10 and June 29, 1927 (J. Speed Rodgers), [CU]; Weeki Wachee Springs, Hernando Co., 1 ♂, March 14, 1955 (J. F. May), [CPK]. ILLINOIS: Putnam Co., 3 ♂, 1 ♀, June 8–12 and September 11 (M. O. Glenn), [USNM, RWH]. KANSAS: Onaga, 1 ♂, "25 · VI" [MCZ]. KENTUCKY: no locality, 4 ♂, 1 ♀ (Chambers), [MCZ]. LOUISIANA: Natchitoches ph., 1 ♀, "VIII" (G. Coverdale), [USNM]. Missouri: Kirkwood, 3 ♂, "9/30 04" (Murtfeldt), [CU]; 2 ♂, W. St. Louis, 1 ♀, VIII · 04 (Aug. Busck), [USNM]. OKLAHOMA: Tenkeller Lake, Cookson, 4 ♂, August 25 through September 4 (D. R. Davis), [DRD]. TEXAS: Brownsville-Los Borregos, 1 ♂, 2 ♀, June 5, 1904 (H. S. Barber), [USNM]; Fedar, 3 ♂, "4 · 1 · 17" Kerrville, 1 ♂, 1 ♀ (F. C. Pratt), [USNM]; Kerrville, 2 ♂, April [USNM]; San Benito, 1 ♂, March 24–30 [USNM].

T. determinatella can be distinguished from the other species of *Triclonella* by the presence of a circular patch of shining straw-colored scales at two-thirds on the forewings.

***Triclonella bicoloripennis*, new species**

(Figs. 71, 180)

Tongue white. Maxillary palpi white with a dark brown dorsal line. Labial palpi: first segment white with scattered gray scales (second and third segments missing). Antennae dark brown to black, ventral surface and an anterior line white. Face gray-brown becoming darker dorsally, a streak of white scales from base of each antenna to base of tongue; vertex dark gray-brown with a few white scales arising above dorsal margin of eyes. Thorax brown. Forewings brown on costal margin to three-fifths; apical fourth brown; a dorsal triangular brown patch at one-half; remainder of wing various shades of straw-brown. Hindwings fuscous. Prothoracic legs pale gray-brown basally, darker distally; apices of tarsal segments white (other legs missing).

Male genitalia: (Fig. 71) R.W.H. slide no. 923.

Female genitalia: no specimens available.

Alar expanse: 7 1/2 mm.

Food plant: unknown.

HOLOTYPE: ♂, Corpus Christi, Texas, September 21, 1943 (W. M. Gordon), [CU Type No. 3803].

T. bicoloripennis can be distinguished from the other species of *Triclonella* by the presence of a few rows of brown scales at the base of the forewings. In the male genitalia the absence of *cornuti* in the *vesica* of the *aedeagus* and the absence of a shoulder in the saccular area will separate *bicoloripennis* from the others.

ANONCIA Clarke

(Figs. 4, 19, 72, 126)

Type: *Hypatopa conia* Walsingham, 1907. Original designation. *Anoncia* Clarke, 1941. Proc. U. S. Natl. Mus., 90: 268. Clarke, 1942. Can. Ent., 74: 17.

Head smooth-scaled; tongue scaled, moderately developed; maxillary palpi folded over base of tongue; labial palpi recurved, second segment rough-scaled and longer than third, apex acute; antennae one-half to two-thirds, pecten present, ciliate in male, ciliate or simple in female.

Forewings elongate ovate, apex acute; 12 veins present; 1b furcate basally; 2-5 equidistant at base; 2 from near angle; 7 and 8 stalked; 11 arising before middle of cell. Hindwings narrower than forewings, anal area moderate; 8 veins present; 1b developed basally; 2 from three-fourths on cell; 3 and 4 connate or stalked; 5, 6, and 7 equidistant; 6 and 7 parallel, 7 slightly sinuate.

Male genitalia: *valvae* broad, ventral; costal processes from base of *valvae*; *aedeagus* heavily sclerotized, ankylosed; *cornuti* absent; a basal process in *aedeagus*; *tegumen* heavily sclerotized, emarginate dorsally; *uncus* absent; arms of *gnathos* separate, left one larger than right.

Female genitalia: *corpus bursae* not sclerotized; *signa* present or absent; *ostium* dorsal in some species; *apophyses anteriores* fused at base.

Clarke (1941) proposed *Anoncia* for several species which had been placed in *Hypatopa* and *Borkhausenia*. In 1942 he transferred *B. longa* and *B. leucoritis* to *Anoncia* and described *A. mentzeliae*, bringing the number of species to ten. Upon examination of the genitalia of the paratypes of *A. conia* and of the material which Heinrich (1921) figured, it is evident that he illus-

trated the genitalia of an undescribed species and not those of *conia*. *A. marinensis* is a synonym of *conia*, and *mentzeliae* is a synonym of *leucoritis*. I am describing nine new species of *Anoncia*, bringing the total number of known species to seventeen. It is unfortunate that some of the species are described from unique specimens; however, where a series of specimens of a species exists, several genitalic preparations have been made; and they serve to reinforce the fact that within a species of this genus there is very little genitalic variation. Mr. Bradley has sent me a sketch of the genitalia of *H. orites*; it is an *Anoncia*, but I can not recognize the species.

Most of the material in collections is from Arizona and California. It is reasonable to assume that future collecting will show that members of the genus are found from Texas to the West Coast and north and south of this region.

KEY TO THE SPECIES OF ANONCIA BASED UPON THE MACULATION

1. Fascia on basal half of forewings 2
 Fascia absent on basal half of forewings 6
2. Forewings white overlaid with dark brown *alboligula*
 Forewings gray-white or buff-white overlaid with brown 3
3. Fascia oblique, farther from base dorsally than costally *nebritis*
 Fascia transverse or convex 4
4. Fascia with buff-brown in center *diveni*
 Fascia unicolorous 5
5. Spot at end of cell confluent with a tornal brown area
 *fasciata*
 Area costad of tornus not heavily covered with brown
 scales *porriginosa*
6. Forewings creamy white; a brown discal spot; a few brown
 scales above tornus, around apex, and outer margin of
 wing *leucoritis*
 Forewings not creamy white 7
7. Forewings and head overlaid with brown or black 8
 Forewings very lightly overlaid with brown; head buff-
 white *longa*
8. Forewings gray-white or buff-white overlaid with gray or
 brown 9
 Forewings white overlaid with dark brown *piperata*
9. Forewings gray-buff heavily overlaid with brown; costal
 margin dark gray-brown *furvicosta*

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	Forewings gray-white or buff-white; discal spot small; if discal spot large, forewings buff-white	10
10.	Forewings buff-white overlaid with brown	11
	Forewings gray-white overlaid with brown	13
11.	Forewings heavily overlaid with brown; cilia of pecten with brown before apices	<i>episcia</i>
	Forewings lightly overlaid with brown; cilia of pecten unicolorous	12
12.	Discal spot large	<i>nocticola</i>
	Discal spot very small	<i>callida</i>
13.	Head heavily overlaid with brown <i>conia</i> , <i>sphacelina</i> , <i>brunniceps</i>	
	Head lightly overlaid with brown, almost white	<i>glacialis</i>

KEY TO THE SPECIES OF ANONCIA BASED UPON THE MALE GENITALIA

1.	Basal processes on left valva stout (Fig. 80)	2
	Basal processes on left valva slender (Fig. 73)	13
2.	Basal process on left valva heavily sclerotized, curved	3
	Basal process or processes on left valva lightly sclerotized, lobate	7
3.	Basal process on right valva short or absent	4
	Basal process on right valva heavily sclerotized, one-half length of valva (Fig. 84)	<i>callida</i>
4.	Left brachium sickle-shaped (Fig. 86)	5
	Left brachium slender (Fig. 81)	<i>nebritis</i>
5.	Valvae deltoid (Fig. 80)	6
	Valvae not deltoid (Fig. 86)	<i>leucoritis</i>
6.	Aedeagus angulate at one-half or two-thirds (Fig. 80) <i>furvicosta</i>	
	Aedeagus curved, not angulate (Fig. 79)	<i>longa</i>
7.	Three teeth on right side of aedeagus at two-thirds ... <i>glacialis</i>	
	No teeth on right side of aedeagus	8
8.	A dorsal projection on left brachium (Fig. 83)	<i>diveni</i>
	Without a dorsal projection on left brachium	9
9.	Two basal processes on left valva	11
	One basal process on left valva	10
10.	Basal process on left valva one-half length of that on right valva (Fig. 76)	<i>alboligula</i>
	Basal process on left valva equal to or longer than that of right valva (Fig. 85)	<i>porriginosa</i>
11.	Costobasal process of left valva longer than medial one <i>episcia</i>	
	Costobasal process of left valva shorter than medial one	12
12.	Right costal process single, tapering gradually to apex (Fig. 78)	<i>piperata</i>

- Right costal process bifid (Fig. 82) *fasciata*
 13. Left brachium slender, "L" shaped (Fig. 73) *sphacelina*
 Left brachium stout, not "L" shaped 14
 14. Left brachium sickle-shaped (Fig. 75) *brunneipes*
 Left brachium not sickle-shaped (Fig. 72) *conia*

Anoncia conia Walsingham

(Figs. 72, 126, 181)

Hypatopa conia Walsingham, 1907. Proc. U. S. Natl. Mus., 33: 212.
Borkhausenia conia, Busck, 1908. Proc. U. S. Natl. Mus., 35: 204.
 Barnes and McDunnough, 1917. Check list of the Lepidoptera of Boreal America, 162. Heinrich, 1921. Jour. Agric. Res., 20: 815. McDunnough, 1939. Mem. S. California Acad. Sci., 2: 77.

Anoncia conia, Clarke, 1941. Proc. U. S. Natl. Mus., 90: 269.

Clarke, 1942. Can. Ent., 74: 17.

"*Borkhausenia*" *marinensis* Keifer, 1935. Monthly Bull. Dept. Agric. California, 24: 215, pl. II, ff. 5A-5E. **new synonymy.**
Borkhausenia marinensis, McDunnough, 1939. Mem. S. California Acad. Sci., 2: 77.

Anoncia marinensis, Clarke, 1941. Proc. U. S. Natl. Mus., 90: 269.

Clarke, 1942. Can. Ent., 74: 17.

Head, thorax, forewings, and legs gray-white overlaid with gray-brown. Labial palpi heavily overlaid with gray-brown, apex of second segment gray-white, base and apex of third segment gray-white. Antennae ciliate in male, simple in female, cilia of pecten gray-brown before apex, apex gray-white. Forewings light on most of discal cell (some specimens are dark on discal cell), an oblique dark band through cell at two-fifths, a dark dash on fold at one-half, cilia with a pale median line. Hindwings shining gray, basal half of cilia darker than distal half. Abdomen unicolorous gray-white. Legs darker colored distally, apices of tarsal segments pale.

Male genitalia: (Fig. 72) R.W.H. slide no. 1015.

Female genitalia: (Fig. 126) R.W.H. slide no. 996.

Alar expanse: 13-17½ mm.

Food plant: *Sphacele calycina* Benth. Kiefer (1935) gives the following discussion of the larval habits: "The larva of this species is much like the one described above [*A. sphacelina*]. It is a miner in *Sphacele* leaves. The mine apparently originates near the base of the leaf on the underside by the midrib, but soon appears

above as a brown area, its shape somewhat determined by the angle of the lateral ribs when the larva is young. The frass is spun against the lower epidermis. The larva may mine in several leaves during its lifetime. The cocoon is oval and rather loosely woven."

Type: *conia*, British Museum (Natural History); *marinensis*, California Academy of Sciences.

Type locality: *conia*, Lake County, Blue Lake, California, Siskiyou County, Mount Shasta, California; *marinensis*, Phoenix Lake, Marin County, California.

Specimens examined: 6 ♂, 7 ♀. CALIFORNIA: Mt. Shasta, Siskiyou Co., 3 ♂, 1 ♀, August 2 through September 1, 1871 (Walsingham), [USNM]; Phoenix Lake, Marin Co., 2 ♂, 3 ♀, larva on *Sphacele calycina*, emerged June 26 through July 1, 1927 and May 12, 1934 (H. H. Keifer), [AFB, RWH]; Riverside, 2 ♀, July 7 and 8, 1933 (H. H. Keifer), [RWH]; Shingle Springs, El Dorado Co., 1 ♂, 1 ♀, May 27, 1931 (H. H. Keifer), [RWH].

A. conia cannot be separated from *A. sphacelina* and *A. brunneipes* by the maculation. (See the statement under *brunneipes* for the characters separating *conia* from *sphacelina* and *brunneipes* by the male genitalia.) In the female genitalia the *ostium* of *conia* is dorsolateral; that of *sphacelina* is ventrolateral. The female of *brunneipes* is unknown.

Anoncia sphacelina Keifer

(Figs. 73, 127, 182)

"*Borkhausenia*" *sphacelina* Keifer, 1935. Monthly Bull. Dept. Agric. California, 24: 214, pl. V.

Borkhausenia sphacelina, McDunnough, 1939. Mem. S. California Acad. Sci., 2: 77.

Anoncia sphacelina, Clarke, 1941. Proc. U. S. Natl. Mus., 90: 269. Clarke, 1942. Can. Ent., 74: 17.

Head, thorax, and forewings gray-white overlaid with gray-brown flecks. Labial palpi heavily overlaid with gray-brown, second segment darker than third; apex of second segment and base and apex of third segment gray-white. Antennae ciliate in male, simple in female; cilia of pecten gray-brown before apex. Forewings pale dorsad of fold and generally in discal cell, a faint line in middle of cilia. Hindwings gray-buff, cilia darker basally. Abdomen light ochreous dorsally, pale buff ventrally. Prothoracic and mesothoracic legs gray-white heavily overlaid with gray-brown, metathoracic legs buff-white lightly overlaid with gray-brown, apices of tarsal segments pale.

Male genitalia: (Fig. 73) R.W.H. slide no. 993.

Female genitalia: (Fig. 127) R.W.H. slide no. 994.

Alar expanse: $16\frac{1}{2}$ – $17\frac{1}{2}$ mm.

Food plant: *Sphacele calycina* Bentham. Keifer (1935) gives the following discussion of the larva and pupa of *sphacelina*:

“The dark brown larvae of this moth form a very conspicuous and characteristic globular chamber amongst bunched leaves, and then mine into these leaves. Pupation takes place within this chamber.

“The pupa is about 6 mm. long, widest at first abdominal segment, glabrous, dark brown. Wings and antennae extending over onto sixth segment. No movable segments. Genital opening in a groove in center of an elevated area; cremaster absent, hooked hairs present.

“Larval length about 12 mm. Head ochreous, black on margins and sides. Prothoracic shield ochreous, black on lateral and posterior $\frac{2}{3}$. Suranal plate black. Tubercles small. Body very dark reddish-brown, intersegmental areas of thorax white; flattened dorso-ventrally. About 20–28 biordinal crochets on anterior prolegs, broken outwardly; posterior prolegs with sixteen crochets.”

Type: California Academy of Sciences.

Type locality: Three miles west of Shingle Springs, El Dorado Co., California.

Specimens examined: 3 ♂, 3 ♀. CALIFORNIA: Shingle Creek, El Dorado Co., 3 ♂, 3 ♀, reared from *Sphacele calycina*, collected April 17–20, 1934 and May 5, 1935, emerged April 28 through May 28 (H. H. Keifer), [AFB, RWH].

A. sphacelina cannot be separated from *A. conia* and *A. brunneipes* by the maculation. The “L” shaped left arm of the *gnathos* in the male genitalia of *sphacelina* will separate it from the known species of *Anoncia*.

Anoncia brunneipes, new species

(Figs. 75, 183)

‡ *Borkhausenia conia*, Heinrich, 1921. Jour. Agric. Res., 20: 815, pl. 97. (misidentification.)

Head, thorax, and forewings gray-white overlaid with brown. Labial palpi paler dorsally on second and third segments, first segment without brown overlay, apex of second segment gray-white, base and apex of third segment gray-white, a few very dark scales on anterior surface of third segment. Antennae ciliate in male,

female unknown, cilia of pecten brown before apex. Forewings almost uniformly overlaid with brown, a small brown spot at two-fifths in cell, one at end of cell, and one at one-half on fold. Hindwings gray-brown. Abdomen buff-gray. Legs buff-white, prothoracic and metathoracic legs heavily overlaid with brown, metathoracic legs with a few pale brown scales, last segment of metathoracic tarsi brown.

Male genitalia: (Fig. 75) Carl Heinrich slide.

Female genitalia: no specimens available.

Alar expanse: 16 mm.

Food plant: unknown.

HOLOTYPE: ♂, San Diego, California, June 20, 1911 (W. S. Wright), [USNM Type No. 66085].

PARATYPES: same locality as type, 3 ♂, June 18 and 20, 1911 [USNM].

A. brunneipes cannot be distinguished with certainty from *A. conia* and *A. sphacelina* by the the maculation. It can be separated from *sphacelina* by the stout left *brachium*, that of *sphacelina* is slender and "L" shaped; the left *brachium* of *brunneipes* has two parts, of which the larger one is sickle-shaped. The left *brachium* of *conia* is single, and it is not sickle-shaped.

Anoncia glacialis, new species

(Figs. 74, 184)

Head white overlaid with dark gray. Thorax, forewings, and legs gray-white overlaid with dark gray. Labial palpi heavily overlaid with dark gray, apex of second segment white, base and apex of third segment white. Antennae ciliate in male, female unknown, cilia of pecten dark gray before apex. Forewings darker along costa, remainder of wings rather uniformly dusted with dark gray. Hindwings buff-gray apically, paler basally; cilia with a faint median line. Prothoracic and mesothoracic legs darker than metathoracic pair, apices of tarsal segments gray-white.

Male genitalia: (Fig. 74) R.W.H. slide no. 995.

Female genitalia: no specimens available.

Alar expanse: 15 ½ mm.

Food plant: unknown.

HOLOTYPE: ♂, Riverside, California, July 8, 1933 (Keifer), [CU Type No. 3811].

A. glacialis can be separated from *A. conia*, *A. sphacelina*, and *A. brunneipes* by the head being lightly overlaid with brown; in the latter three species the head is heavily overlaid with brown.

The presence of three teeth on the right side of the *aedeagus* at two-thirds in the male genitalia will distinguish the male of this species from the males of the other species of *Anoncia*.

***Anoncia fasciata* Walsingham**

(Figs. 82, 129, 185)

Hypatopa fasciata Walsingham, 1907. Proc. U. S. Natl. Mus., 33: 213.

Borkhausenia fasciata, Barnes and McDunnough, 1917. Check list of the Lepidoptera of Boreal America, 162. Heinrich, 1921. Jour. Agric. Res., 20: 815. McDunnough, 1939. Mem. S. California Acad. Sci., 2: 77.

Anoncia fasciata, Clarke, 1941. Proc. U. S. Natl. Mus., 90: 269. Clarke, 1942. Can. Ent., 74: 17.

Head, thorax, forewings, and legs gray-white heavily overlaid with brown. Labial palpi gray-white at apex of second segment and at base and apex of third segment. Antennae ciliate in male, female unknown, cilia of pecten brown before apex, apex gray-white. Forewings with a brown fascia at one-third, preceded by a narrow gray-white fascia; a brown discal spot, a brown spot at end of cell, and one on fold at one-half; basal half of cilia overlaid with brown, distal half with brown flecks; a faint postmedial line and a faint subterminal line in cilia. Hindwings gray-brown, cilia with a faint antemedial line. Abdomen buff-white. Legs becoming paler from prothoracic through metathoracic pairs, outer tibial spurs of metathoracic legs dark, metathoracic tibiae with a pale annulation at one-half and another at apex, apices of tarsal segments pale.

Male genitalia: (Fig. 82) A. Busck slide.

Female genitalia: (Fig. 129) R.W.H. slide no. 1012.

Alar expanse: 13–16 $\frac{1}{2}$ mm.

Food plant: unknown.

Type: British Museum (Natural History).

Type locality: Head Noyo River, Mendocino County, California; past Little Lake; Lake County, Blue Lake; Colusa County, North Fork Cache Creek.

Specimens examined: 3 ♂. CALIFORNIA: Head of Noyo River, Mendocino Co., 1 ♂, June 8–11, 1871 (Walsingham), [USNM]; past Little Lake, Mendocino Co., 2 ♂, June 12, 1871 (Walsingham), [USNM].

See discussion under *A. porriginosa* for characters separating the two species.

Anoncia porriginosa, new species

(Figs. 85, 186)

Head, thorax, forewings, and legs gray-white heavily overlaid with brown. Labial palpi with gray-white at apex of second segment and at base and apex of third segment. Antennae ciliate in male, female unknown, cilia of pecten with brown before apex. Forewings with a brown fascia at one-third, preceded by a narrow gray-white band; a small brown discal dot, another at end of discal cell, and one at one-half on fold. Hindwings gray-brown, a faint antemedial line in cilia. Abdomen buff-white overlaid with brown. Metathoracic tibiae and tarsi buff-white, apices of tarsal segments pale.

Male genitalia: (Fig. 85) R.W.H. slide no. 1029.

Female genitalia: no specimens available.

Alar expanse: 13-15 mm.

Food plant: unknown.

HOLOTYPE: ♂, Claremont, CALIFORNIA (Metz), [USNM Type No. 66086].

PARATYPES: same data as type, 5 ♂, [USNM, RWH].

A. porriginosa can be separated from *A. fasciata* by the absence of a brown patch above the tornus. In the male genitalia there is one basal process on the left *valva* of *porriginosa*, two on the left *valva* of *fasciata*. The right basal process of *porriginosa* is single, that of *fasciata* is bifid.

Anoncia alboligula, new species

(Figs. 76, 187)

Head, thorax, forewings, and legs white overlaid with dark brown. Tongue white. Labial palpi dark brown on outer surface of second segment, apex of second segment white, base and apex of third segment broadly white. Antennae ciliate in male, female unknown, cilia of pecten gray-brown before apex, anterior surface and apex of scape white. Forewings with a broad brown fascia at one-third, preceded by a white one; a dark brown dash at one-half on fold; pale gray-brown dusting on cilia at apex; cilia with a post-medial and a subterminal gray-brown line. Hindwings gray-brown, a faint basal line in cilia. Abdomen buff-white dorsally, white ventrally. Apices of tarsal segments white.

Male genitalia: (Fig. 76) R.W.H. slide no. 1027.

Female genitalia: no specimens available.

Alar expanse: 13 mm.

Food plant: unknown.

HOLOTYPE: ♂, Olancha, Inva (*sic*) [Inyo] Co., CALIFORNIA, June 24-30 [USNM Type No. 66087].

The combination of white forewings and a fascia on the basal half of the forewings separates *alboligula* from the other species of *Anoncia*. In the male genitalia the single lobate basal process of the left valva being one-half the length of the process of the right valva will separate *alboligula* from *A. porriginosa* and *A. fasciata*.

***Anoncia nebritis*, new species**

(Figs. 81, 132, 188)

Head, thorax, and forewings gray-white overlaid with brown. Labial palpi heavily overlaid with brown, apex of second segment gray-white, base and apex of third segment gray-white, a few gray-white scales on inner surface of second segment, gray-white scales general on third segment. Antennae ciliate in male and female, median gray color of cilia of pecten blending gradually into gray-white of extremities, scape gray-white at base and apex. Forewings brown on costa to two-thirds, an oblique fascia at one-half from costal margin to dorsad of fold, a brown blotch at one-fourth from costa to fold or slightly beyond it. Hindwings dark gray. Abdomen ochreous dorsally, buff-white ventrally. Legs gray-white overlaid with brown on coxae, trochanters, and femora; buff-white overlaid with brown on tibiae and tarsi; dorsal surface of metathoracic tibiae with long buff-white scales; metathoracic tibiae with a sub-basal, medial, and apical buff-white annulation; apices of tarsal segments buff-white.

Male genitalia: (Fig. 81) R.W.H. slide no. 985.

Female genitalia: (Fig. 132) R.W.H. slide no. 986.

Alar expanse: $9\frac{1}{2}$ –11 mm.

Food plant: unknown.

HOLOTYPE: ♂, Madera Canyon, 4,880 feet, Santa Rita Mountains, Santa Cruz Co., ARIZONA, July 12, 1959 (R. W. Hodges), [CU Type No. 3807].

PARATYPES: same locality as type, 3 ♂, 1 ♀, July 11–25, 1959 [CU, RWH].

The oblique fascia on the forewings will separate *nebritis* from *A. diveni*, *A. fasciata*, and *A. porriginosa*. In the male genitalia the heavily sclerotized basal process on the left valva will separate *nebritis* from the same three species. In *nebritis* the basal process on the left valva is lightly sclerotized and lobate.

Anoncia diveni Heinrich

(Figs. 83, 134, 189)

Borkhausenia diveni Heinrich, 1921. Jour. Agric. Res., 20: 814, pl. 96, ff. C-F. McDunnough, 1939. Mem. S. California Acad. Sci., 2: 77.

Anoncia diveni, Clarke, 1941. Proc. U. S. Natl. Mus., 90: 269. Clarke, 1942. Can. Ent., 74: 17.

Head, thorax, forewings, and abdomen gray-white overlaid with brown. Labial palpi heavily overlaid with brown on basal half of second segment and at middle of third segment. Antennae ciliate in male, simple in female, cilia of pecten unicolorous. Forewings brown on costa at base, a brown fascia at two-fifths, buff-brown scales in middle of fascia, scattered brown and buff-brown scales on apical half of wing. Hindwings gray-brown. Legs heavily overlaid with brown; mesothoracic and metathoracic tibiae with gray-white, almost white, annulations at one-third, two-thirds, and apex; apices of first two tarsal segments of prothoracic and mesothoracic legs gray-white; apices of first, second, third, and fifth tarsal segments of metathoracic legs gray to buff-white.

Male genitalia: (Fig. 83) Carl Heinrich slide.

Female genitalia: (Fig. 134) R.W.H. slide no. 10001.

Alar expanse: 12-13 mm.

Food plant: *Lantana horrida*. According to Diven (note accompanying specimens), "Larvae making a narrow blotch mine at the edge of the leaf and curling the edge near base, pupating within the mine." Heinrich's (1921) description of the larva and pupa is as follows:

"The larva when full-grown is 7.5 to 9 mm. long; white, with the thoracic segments and the anterior portion of the first abdominal segment a brilliant wine-red: in fully fed specimens there is often a pinkish suffusion on the dorsum of the abdominal segments; thoracic shield yellow, posteriorly and laterally edged with dark brown; anal shield pale yellow, other chitinized portions of thoracic segments dark brown; thoracic legs blackish brown, paler on inner sides; body tubercles deep brown, minute; setae pale, slender, moderately long; crochets of prolegs dark brown, 24 to 26, biordinal and in a circle broken outwardly; spiracles pale yellow, small, round, inconspicuous; no anal fork; head pale yellow with a dark brown band on each side, extending from the ocelli to the lateral incision of the hind margin; ocellar pigment black, continuous under the ocelli.

"The pupa is rather stout and short, 1.5 to 2 mm. wide by 4.5 to

5 mm. long; pale yellow-brown; smooth; caudal end rounded; cremaster absent; wings and antennae extending to anterior margin of sixth abdominal segment; labial palpi clearly defined but small, *not* extending to proximolateral angles of maxillae; between genital and anal openings a divided, blackish, chitinated rise, without spines, hairs, or other armature."

Type: United States National Museum.

Type locality: Brownsville, Texas.

Specimens examined: 2 ♂, 2 ♀. TEXAS: Brownsville, 2 ♂, 2 ♀, collected on *Lantatum horrida*, April 22, 1919, emerged April 30 and May 5, 1919 (Diven), [USNM].

A. diveni can be separated from the other species of *Anoncia* by the presence of buff-brown scales in the center of the fascia.

***Anoncia episcia* Walsingham**

(Figs. 77, 190)

Hypatopa episcia Walsingham, 1907. Proc. U. S. Natl. Mus., 33: 211.

Borkhausenia episcia, Barnes and McDunnough, 1917. Check list of the Lepidoptera of Boreal America, 162. Heinrich, 1921. Jour. Agric. Res., 20: 815. McDunnough, 1939. Mem. S. California Acad. Sci., 2: 77.

Anoncia episcia, Clarke, 1941. Proc. U. S. Natl. Mus., 90: 269. Clarke, 1942. Can. Ent. 74: 17.

Head, thorax, forewings, and legs buff-white heavily overlaid with brown. Labial palpi buff-white at apex of second segment and at base and apex of third segment. Antennae ciliate in male, female unknown, cilia of pecten gray-brown before apex. Forewings with a small brown discal spot, a brown spot at end of cell, and one at one-half on fold. Hindwings gray-brown. Metathoracic legs less heavily overlaid with brown than prothoracic and mesothoracic legs, apices of tarsal segments pale.

Male genitalia: (Fig. 77) R.W.H. slide no. 1011.

Female genitalia: no specimens available.

Alar expanse: 13 mm.

Food plant: unknown.

Type: British Museum (Natural History).

Type locality: Sonoma County, Russian River, California; Mendocino County, head of Noyo River, California; past Little Lake, Mendocino Co., California.

Specimens examined: 1 ♂. CALIFORNIA: Dry Creek, Sonoma Co., 1 ♂, May 20–21, 1871 (Walsingham), [USNM].

A. episcia can be separated from *A. nocticola* and *A. callida* by the pecten being brown before the apex and by the forewings being heavily overlaid with brown. In the male genitalia of *episcia* the basal process of the right *valva* is longer than the *valva*; that of *callida* is one-half the length of the *valva*.

Anoncia callida, new species

(Figs. 84, 191)

Head, thorax, forewings, and legs buff-white overlaid with dark gray. Labial palpi heavily overlaid with dark gray, apices of segments white. Antennae ciliate in male, female unknown, cilia of pecten unicolorous. Forewings irregularly overlaid with dark gray, darkest along costa at base of wings; a dark gray spot at end of cell. Hindwings buff-gray. Apices of tarsal segments white or buff.

Male genitalia: (Fig. 184) R.W.H. slide no. 582.

Female genitalia: no specimens available.

Alar expanse: 17½ mm.

Food plant: unknown.

HOLOTYPE: ♂, Madera Canyon, 4,880 feet, Santa Rita Mountains, Santa Cruz Co., ARIZONA, July 17, 1959 (R. W. Hodges), [CU Type No. 3805].

The buff-white forewings which are evenly and lightly overlaid with brown will separate *callida* from the other species of *Anoncia*. In the male genitalia the combination of the basal processes of both *valvae* being heavily sclerotized and moderately long will separate the male of *callida* from the males of the other species of *Anoncia*.

Anoncia piperata, new species

(Figs. 78, 192)

Head, thorax, forewings, and legs white overlaid with dark brown. Labial palpi: second segment white dorsally and at apex, base and apex of third segment white. Antennae ciliate in male, female unknown, cilia of pecten brown before apex. Forewings irregularly dusted with brown, cilia white with a postmedial and a subterminal line. Hindwings buff-gray, cilia with a basal line and a faint antemedial line around apex. Legs heavily overlaid with brown, apices of tarsal segments white.

Male genitalia: (Fig. 78) R.W.H. slide no. 473.

Female genitalia: no specimens available.

Alar expanse: 20 mm.

Food plant: unknown.

HOLOTYPE: ♂, Smoky Valley, 6,200 feet, Tulare Co., CALIFORNIA, 6-8-44 (C. Henne), [USNM Type No. 66088].

The white forewings overlaid with brown will separate *piperata* from the other species of *Anoncia*. The key based on the male genitalia will serve to distinguish *piperata* from the other species of *Anoncia*.

***Anoncia leucoritis* Meyrick**

(Figs. 86, 130, 193)

Borkhausenia leucoritis Meyrick, 1927. Exot. Mier., 3: 381. McDunnough, 1939. Mem. S. California Acad. Sci., 2: 77.

Anoncia leucoritis, Clarke, 1942. Can. Ent., 74: 17.

Anoncia mentzeliae Clarke, 1942. Can. Ent., 74: 18. **new synonymy.**

Head, thorax, forewings, and legs pale buff-white, almost white. Antennae ciliate in male and female, cilia of peeten unicolorous. Forewings with a patch of brown scales above tornus, a few brown scales in middle and at end of cell, very few scales with brown flecks in cilia. Hindwings buff-gray, cilia with a faint antemedial line at apex. Abdomen buff. Distal segments of legs overlaid with brown, prothoracic pair darker than mesothoracic pair, mesothoracic pair darker than metathoracic pair, apices of tarsal segments pale.

Male genitalia: (Fig. 86) August Busck slide.

Female genitalia: (Fig. 130) J.F.G. Clarke slide no. 3203.

Alar expanse: 16-19½ mm.

Food plant: *Mentzelia laevicaulis* (Dougl.) T. and G. According to Clarke (1942), "The larva of *mentzeliae* feeds in the immature ovaries of the food plant. Pupation occurs in a loosely constructed cocoon within the ovary."

Type: *leucoritis*, British Museum (Natural History); *mentzeliae*, United States National Museum.

Type locality: *leucoritis*, Alpine, Texas, 7,500 feet; *mentzeliae*, Snake River, Whitman County, Washington, opposite Clarkston.

Specimens examined: 9 ♂, 7 ♀. TEXAS: Alpine, 5,000 feet, 1 ♂, "5.27" [USNM]. WASHINGTON: Snake River opp. Clarkston, Whitman Co., 7 ♂, 6 ♀, reared from *Mentzelia laevicaulis*, emerged August 7-23, 1940 (J. F. G. Clarke), [USNM]; Walla Walla, 1 ♂, 1 ♀, June 27, 1925 (H. P. Lanchester), [USNM].

A. leucoritis can be separated from *A. longa* by the color; *leucoritis* is creamy white; *longa* is buff-white. And, by the alar expanse, that of *leucoritis* is 16–19½ mm., that of *longa* is 23–26 mm. The *valvae* of the male genitalia of *leucoritis* are not deltoid; those of *longa* are deltoid. In the female genitalia the *ostium* opens dorsally in *longa*, laterally in *leucoritis*.

Anoncia longa Meyrick

(Figs. 79, 133, 194)

Borkhausenia longa Meyrick, 1927. Exot. Micr., 3: 381. McDunnough, 1939. Mem. S. California Acad. Sci., 2: 77.

Anoncia longa, Clarke, 1941. Proc. U. S. Natl. Mus., 90: 269. Clarke, 1942. Can. Ent., 74: 17.

Head, thorax, abdomen, wings, and legs buff-white. Antennae ciliate in male and female, cilia of pecten unicolorous. Forewings with pale ochreous dusting on costa; a tawny discal spot, a tawny spot at end of cell, and one on fold at two-thirds; a light tawny to ochreous dusting on outer third. Hindwings overlaid with tawny in some specimens. Prothoracic legs overlaid with tawny in one specimen.

Male genitalia: (Fig. 79) A. Busck slide.

Female genitalia: (Fig. 133) R.W.H. slide no 1007.

Alar expanse: 23–26 mm.

Food plant: unknown.

Type: British Museum (Natural History).

Type locality: Alpine, Texas, 7,500 feet; Dividend, Utah.

Specimens examined: 3 ♂, 1 ♀. ARIZONA: Paradise, Cochise Co., 1 ♂, September [USNM]; Prescott, 1 ♂, 1–7·X [USNM]. UTAH: Dividend, 1 ♂, “7.27” [USNM]; Eureka, 1 ♀, August 18, 1911 (Tom Spalding), [USNM].

See the discussion under *A. leucoritis* for the points of separation between the two species.

Anoncia furvicosta, new species

(Figs. 80, 131, 195)

Head and thorax gray-buff heavily overlaid with dark gray-brown. Labial palpi with apex of second segment white, a few white scales at base of third segment. Antennae ciliate in male and female, cilia of pecten slightly darker before apex. Forewings buff-

brown; dark gray-brown, almost black, on costa from base to three-fourths; a dark gray-brown discal spot; a dark gray-brown spot at end of cell; a series of subterminal spots of same color on outer margin and beyond costal band; cilia concolorous with wing. Hindwings dark gray. Abdomen buff-brown dorsally, gray ventrally, last segment buff. Legs buff-brown, apices of tarsal segments buff.

Male genitalia: (Fig. 80) R.W.H. slide no. 981.

Female genitalia: (Fig. 131) R.W.H. slide no. 982.

Alar expanse: 14–21 mm.

Food plant: unknown.

HOLOTYPE: ♂, Madera Canyon, 4,880 feet, Santa Rita Mountains, Santa Cruz Co., ARIZONA, July 12, 1959 (R. W. Hodges), [CU Type No. 3806].

PARATYPES: same locality as type, 56 ♂, 19 ♀, July 11–23, 1959 [CU, RWH, USNM, BMNH, LACM, CAS, AFB].

The large size and heavy overlay of dark gray-brown of the forewings of *furvicosta* will separate it from *A. nocticola*. The angulate *aedeagus* in combination with the heavily sclerotized basal process on the left *valva* will separate the male of *furvicosta* from the males of the other species of *Anoncia*.

***Anoncia nocticola*, new species**

(Figs. 128, 196)

Head, thorax, forewings, and legs buff-white overlaid with brown. Labial palpi buff-white at apex of second segment and at base and apex of third segment. Antennae ciliate in female, male unknown, cilia of pecten unicolorous. Forewings with a large discal spot, brown flecks not forming a pattern. Apices of tarsal segments buff-white.

Male genitalia: no specimens available.

Female genitalia: (Fig. 128) R.W.H. slide no. 1026.

Alar expanse: 10½ mm.

Food plant: unknown.

HOLOTYPE: ♀, Madera Canyon, 4,880 feet, Santa Rita Mountains, Santa Cruz Co., ARIZONA, August 3, 1959 (R. W. Hodges), [CU Type No. 3808].

A. nocticola can be separated from *A. nebritis* by the absence of a fascia in the forewing. Sternites two through five of the female of *nocticola* are lightly sclerotized; these sternites are not sclerotized in the female of *nebritis*.

Anoncia orites Walsingham

Hypatopa orites Walsingham, 1907. Proc. U. S. Natl. Mus., 33: 213.

Borkhausenia orites, Barnes and McDunnough, 1917. Check list of the Lepidoptera of Boreal America, 162. Heinrich, 1921. Jour. Agric. Res., 20: 815. McDunnough, 1939. Mem. S. California Acad. Sci., 2: 77.

Anoncia orites, Clarke, 1941. Proc. U. S. Natl. Mus., 90: 269. Clarke, 1942. Can. Ent., 74: 17.

I quote Walsingham's original description because I have seen no specimens.

"*Antennae* brownish gray; basal joint pectinate.

Palpi strongly recurved to the back of the head above; grayish white, much dusted with brownish fuscous, especially on the outer side of the median joint.

Head grayish white, sprinkled with fuscous.

Thorax grayish white, suffused and sprinkled with brownish fuscous.

Forewings grayish white, suffused and sprinkled with brownish fuscous; the central portion of the wing, on which is exhibited a dark discal shade-spot is an elongate dark streak in the fold, and a dark shade at the end of the fold is a little less obliquely placed in relation to a spot at the end of the cell; the apex and termen show slight pale interruptions in the dark shading, which gives the appearance of a series of ill-defined marginal shade-spots extending through the whitish gray cilia; the whole wing has thus a mottled and speckled appearance, the white ground-color showing chiefly before and beyond the discal spot, and in two rather oblique marks pointing to the flexus beneath the basal half of the fold.

Alar expanse—16 mm.

Hindwings shining, grayish brown; cilia brownish ochreous.

Abdomen pale brownish ochreous.

Legs pale brownish ochreous."

Food plant: unknown.

Type: British Museum (Natural History).

Type locality: Mount Shasta, Siskiyou County, California.

ANNOTATED LIST OF THE NORTH AMERICAN COSMOPTERIGIDAE, WALSHIIDAE, AND MOMPHIDAE

The list of the Cosmopterigidae follows the arrangement presented in the systematic part of this paper. Synonyms are indicated by italics.

The list of the WalshIIDae gives the generic citations and type designations. The types of Chambers' Cosens', Busek's, and Forbes' species have been examined; and authentic specimens of Braun's and Clemens' species have been seen. Thus, the arrangement of genera and species is based on a study of all the North American species. In addition lectotypes of Chambers' species are designated whenever it is necessary. *Ascalenia*, a European genus, is included.

The list of the Momphidae gives generic citations and type designations. Types of the genera have been examined; therefore, the generic synonymy and the arrangement of the genera should not have to be materially changed.

COSMOPTERIGIDAE

- COSMOPTERIX Huebner, [1826]
 nitens Walsingham, 1889
 molybdina, *sp. nov.*
 pulchrimella Chambers, 1875
 bendidia, *sp. nov.*
 attenuatella Walker, 1864
flavofasciata Wollaston, 1879
antillia Forbes, 1931
mimetis Meyrick, 1897
 clandestinella Busek, 1906
 montisella Chambers, 1875
unicolorella Walsingham, 1889
 magophila Meyrick, 1919
 gracilens, *sp. nov.*
 dapifera, *sp. nov.*
 delicatella Walsingham, 1889
 dicacula, *sp. nov.*
 lespedezae Walsingham, 1882
 opulenta Braun, 1919
 quadrilineella Chambers, 1878
 minutella Beutenmueller, 1889

abditata, *sp. nov.*
inopis, *sp. nov.*
chalybaeella Walsingham, 1889
gemmiferella Clemens, 1860
bacata, *sp. nov.*
damnosa, *sp. nov.*
clemensella Stainton, 1860
 hermodora Meyrick, 1919
scirpicola, *sp. nov.*
ebriola, *sp. nov.*
fernaldella Walsingham, 1882
floridanella Beutenmueller, 1889
 nigrapunctella Busck, 1900
facunda, *sp. nov.*

TANYGONA Braun, 1923
 lignicolorella Braun, 1923
 ipomoeae Busck, 1900

ERALEA, *gen. nov.*
 albalineella Chambers, 1878
 striata, *sp. nov.*

MELANOCINCLIS, *gen. nov.*
 lineigera, *sp. nov.*
 nigrilineella Chambers, 1878

ETEODALEA, *gen. nov.*
 sexnotella Chambers, 1878
 wyattella Barnes and Busck, 1920
 iridella Busck, 1907
 niphochrysa Meyrick, 1930
 enchrysa, *sp. nov.*

SATHROBROTA, *gen. nov.*
 rileyi Walsingham, 1882
 badia, *sp. nov.*

LIMNAECIA Stainton, 1851
 phragmitella Stainton, 1851

TELADOMA Busck, 1932

helianthi Busck, 1932

astigmatica Meyrick, 1928

murina, *sp. nov.*

incana, *sp. nov.*

TRICLONELLA Busck, 1901

pergandeella Busck, 1901

xuthocelis, *sp. nov.*

antidectis Meyrick, 1914

determinatella Zeller, 1873

bicoloripennis, *sp. nov.*

ANONCIA Clarke, 1941

conia Walsingham, 1907

marinensis Keifer, 1935

sphacelina Keifer, 1935

brunneipes, *sp. nov.*

glacialis, *sp. nov.*

fasciata Walsingham, 1907

porriginosa, *sp. nov.*

alboligula, *sp. nov.*

nebritis, *sp. nov.*

diveni Heinrich, 1921

episcia Walsingham, 1907

callida, *sp. nov.*

piperata, *sp. nov.*

leucoritis, Meyrick, 1927

mentzeliae Clarke, 1942

longa, Meyrick, 1927

furvicosta, *sp. nov.*

nocticola, *sp. nov.*

orites Walsingham, 1907

WALSHIIDAE

ASCALENIA Wocke, *in* Heinemann, 1877 [1876]. Schmetterlinge
Deutschlands und der Schweiz, 2: 421.

TYPE: *Laverna vanella* Frey, 1860. Monobasic.

vanella Frey, 1860

PERIPLOCA Braun, 1919. Ent. News, 30: 261.

TYPE: (*Periploca purpuriella* Braun, 1919) = *Elachista concolorella* Chambers, 1875. Monobasic.

concolorella Chambers, 1875

purpuriella Braun, 1919

ceanothiella Cosens, 1908

gleditschiaeella Chambers, 1876

nigra Hodges, 1962

atrata Hodges, 1962

fessa Hodges, 1962

facula Hodges, 1962

laeta Hodges, 1962

funebria Hodges, 1962

cata Hodges, 1962

gulosa Hodges, 1962

mimula Hodges, 1962

WALSHIA Clemens, 1864. Proc. Ent. Soc. Philadelphia, 2: 418.

TYPE: *Walshia amorphella* Clemens, 1864. Monobasic.

particornella Busck, 1909

amorphella Clemens, 1864

miscecolorella Chambers, 1875

miscecalonella Chambers, 1875. *lapsus calami*.

dispar Hodges, 1961

similis Hodges, 1961

exemplata Hodges, 1961

PERIMEDE Chambers, 1874. Can. Ent., 6: 51.

TYPE: *Perimede erransella* Chambers, 1874. Monobasic.

erransella Chambers, 1874

falcata Braun, 1919

ricina Hodges, 1962

battis Hodges, 1962

latris Hodges, 1962

AEAEA Chambers, 1874. Can. Ent. 6: 73.

TYPE: *Aeaea ostryaeella* Chambers, 1874. Monobasic.

ostryaeella Chambers, 1874

quadricristatella Chambers, 1879

CHRYSOPELEIA Chambers, 1874. Can. Ent., 6: 72.

TYPE: *Chrysopelia purpuriella* Chambers, 1874. Monobasic.

purpuriella Chambers, 1874.

Lectotype: ♂, bearing following labels: 1) Type, 1358. 2) Kentucky, Chambers. 3) 96. 4) male Genitalia Slide 871, Ronald W. Hodges. 5) MCZ slide 792; Museum of Comparative Zoology.

STILBOSIS Clemens, 1860. Proc. Acad. Natl. Sci. Philadelphia, 12: 170.

TYPE: *Stilbosis tesquella* Clemens, 1860. Monobasic.

tesquella Clemens, 1860

quinquicristatella Chambers, 1880

AMAUROGRAMMA Braun, 1919. Ent. News, 30: 261.

TYPE: *Amaurogramma extensa* Braun, 1919. Monobasic.

extensa Braun, 1919

SORHAGENIA Spuler, 1910. Schmetterlinge Europas, 2: 384.

TYPE: *Elachista rhamniella* Zeller, 1839. Monobasic.

Cystioecetes Braun, 1915. Can. Ent., 47: 194.

TYPE: *Cystioecetes nimbosus* Braun, 1915. Monobasic.

rhamniella Zeller, 1839

nimbosa Braun, 1915

ITHOME Chambers, 1875. Can. Ent., 7: 93.

TYPE: *Ithome unimaculella* Chambers, 1875. Monobasic.

Eriphia Chambers, 1875. Can. Ent., 7: 55; preoccupied.

TYPE: *Eriphia concolorella* Chambers, 1875. Monobasic.

concolorella Chambers, 1875

unimaculella Chambers, 1875

quinquepunctata Forbes, 1931

lassula Hodges, 1962

edax Hodges, 1962

ferax Hodges, 1962

MOMPHIDAE

MOMPHA Huebner, 1816 [1826]. Verzeichniss Bekanntter Schmetterlinge (*sic*), 414.

TYPE: *Tinea conturbatella* Huebner, [1818-1819]. Designated by Walsingham and Durrant, Ent. Mo. Mag., 45: 173, 1909.

Anybia Stainton, 1854. Insecta Britannica. Lepidoptera: Tineina, 244.

TYPE: *Tinea langiella* Huebner, [1801]. Monobasic. [= *Alucita epilobiella* Roemer, 1794].

Cyphophora Herrich-Schaeffer, [1853]. Systematische Bearbeitung der Schmetterlinge von Europa, 5: 45; 6: pl 13, ff. 7-9.

TYPE: *Elachista idaei* Zeller, 1839. Monobasic.

Laverna Curtis, 1839. British Entomology, 16: expl. for pl. 735.

TYPE: *Laverna ochraceella* Curtis, 1839. Monobasic.

Leucophryne Chambers, 1875. Can. Ent., 7: 210.

TYPE: *Leucophryne tricristatella* Chambers, 1875. Monobasic.

Lophoptilus Sircom, 1848. Zoologist, 6: 2037.

TYPE: *Lophoptilus staintoni* Sircom, 1848. Monobasic.

*Psacaphora*¹ Herrich-Schaeffer, [1853]. Systematische Bearbeitung der Schmetterlinge von Europa, 5: 48; 6: pl. 13, ff. 22-24.

TYPE: *Tinea schrankella* Huebner, [1800-1805]. Designated by Walsingham and Durrant, Ent. Mo. Mag., 45: 155, 1909.

Wilsonia Clemens, 1864. Proc. Ent. Soc. Philadelphia, 2: 428.

TYPE: *Wilsonia brevivitella* Clemens, 1864. Monobasic.

albella Chambers, 1875

albapalpella Chambers, 1875

bifasciella Chambers, 1876

brevivitella Clemens, 1872

oenotheraevorella Chambers, 1880

oenotheraeseminella Chambers, 1876

stellella Busck, 1906

circumscripella Zeller, 1873

pecosella Busck, 1907

bottimeri Busck, 1940

capella Busck, 1940

coloradella Chambers, 1877

definitella Zeller, 1873

unicristatella Chambers, 1875

ignobilisella Chambers, 1875

claudiella Kearfott, 1907

minimella Chambers, 1880

murtfeldtella Chambers, 1875

albocapitella Chambers, 1875

grissaeella Chambers, 1875

obscurusella Chambers, 1875

parvicristatella Chambers, 1875

¹ It seems to me as though some of the species described in *Psacaphora* do not belong in the genus *Mompha*. Future study will probably indicate that they should be placed in a separate genus.

unifasciella Chambers, 1876
 rufocristatella Chambers, 1875
 punctiferella Busck, 1906
 nuptialis Meyrick, 1922
 conturbatella Huebner, [1818-1819]
 bieristatella Chambers, 1879
 purpuriella Busck, 1909. new combination.
 edithella Barnes and Busck, 1920. new combination.
 terminella Westwood, 1851
engelella Busck, 1906
 deceptella Braun, 1921. new combination.
 sexstrigella Braun, 1921. new combination.
 annulata Braun, 1923. new combination.
 difficilis Braun, 1923. new combination.
 communis Braun, 1925. new combination.
 argentimaculella Murtfeldt, 1900
 luciferella Clemens, 1860
 cephalanthiella Chambers, 1871
 metallifera Walsingham, 1882. new combination.
 tricristatella Chambers, 1875. new combination.
grandisella Chambers, 1875
subiridescens Walsingham, 1882
 passerella Busck, 1909. new combination.
 eloisella Clemens, 1860
magnatella Zeller, 1873
oenotheracella Chambers, 1875
lyonetiella Chambers, 1875

SYNALLAGMA Busck, 1907. Ent. News, 18: 277.

TYPE: *Synallagma busckiella* Engel, 1907. Monobasic.
 busckiella Engel, 1907

HOMALEDRA Busck, 1900. Proc. U. S. Natl. Mus., 33: 236.

TYPE: *Homaledra heptathalama* Busck, 1900. Original designation.

heptathalama Busck, 1900

sabalella Chambers, 1880

BATRACHEDRA Herrich-Schaeffer, [1853]. Systematische Bearbeitung der Schmetterlinge von Europa, 5: 54; 6: pl. 9, ff. 18-21.

TYPE: *Ornix turdipennella* Treitschke, 1833. Monobasic. [= *Gracillaria praecangusta* Haworth, [1828]]. [I do not know *Ornix turdipennella* Kollar, 1832. Beitrage zur Landeskunde

Oesterreichs unter der Enns (Wien), 2: 99. (This paper has not been seen.)]

praeangusta Haworth [1828]

pulvella Chambers, 1876

clemensella Chambers, 1877

striolata Zeller, 1873

concitata Meyrick, 1928

salicipomonella Clemens, 1867

mathesoni Busck, 1917

knabi Walsingham, 1909

enormis Meyrick, 1928. **new synonymy.**

linaria Clark, 1957

(?) *trichella* Busek, 1908

concors Meyrick, 1916. **new synonymy.**

AETIA Chambers, 1880. Jour. Cincinnati Soc. Nat. Hist., 2: 186.

TYPE: *Actia bipunctella* Chambers, 1880. Monobasic.

Chaetocampa Busck, 1926. Jour. Agric. Res., 33: 804. **new synonymy.**

TYPE: *Chaetocampa crotonella* Bottimer, 1926. Monobasic.

bipunctella Chambers, 1880

crotonella Bottimer, 1926. **new synonymy.**

BLASTODACNA Wocke, in Heinemann, 1877 [1876]. Schmetterlinge Deutschlands und der Schweiz, 2: 428.

TYPE: *Alucita hellerella* Duponchel, [1838]. Designated by Fletcher, Catalogue of Indian Insects, pt. 16: 25, 1928.

Spuleria Hofman, 1897. Iris, 10: 230.

TYPE: *Tinea aurifrontella* Hübner, [1832]. Monobasic.

curvilineella Chambers, 1872

bicristatella Chambers, 1875

Lectotype: ♂, bearing following labels: 1) Type, 1459. 2)

Chambers, Canada. 3) *Gelechia bicristatella*, Canada, Cham.

4) Elachistid, AB Oct. 1902. Museum of Comparative Zoology.

placendiella Busck, 1908. **new synonymy.**

sublustris Meyrick, 1922. **new synonymy.**

CHRYSOCLISTA Stainton, 1854. Insecta Britannica. Lepidoptera: Tineina, 240.

TYPE: *Phalaena linneella* Clerck, 1759. Designated by Fletcher, Catalogue of Indian Insects, pt. 16: 25, 1928.

linneella Clerck, 1759

villella Busck, 1904

cambiella Busck, 1915. **new combination.**

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- , *in* Heinemann, O. von. 1877 [1876]. Die Schmetterlinge Deutschlands und der Schweiz. Braunschweig: Schwetschke und Sohn, vol. 2, pt. 2.

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ADDENDA

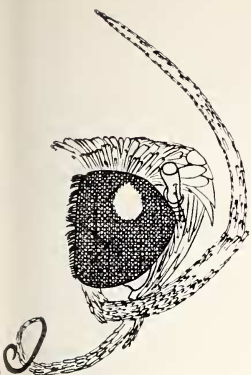
The following additions have been made since the writing of this paper: 1. The type specimens of *Sathrobrotia rileyi* Walsingham and *Sathrobrotia stigmatophora* Walsingham have been examined by Mr. Bradley; and according to the diagnostic characters of *rileyi*, *stigmatophora* is the same as *rileyi* (new synonymy). 2. *Anoncia aciculata* Meyrick occurs in the geographic area of this paper. Clarke (in press) illustrates the male genitalia and the habitus of the type. 3. I have seen another species of *Antequera* as well as more material of Cosmopterigidae from the Old World tropics, and because of this, now retain this genus in the family. The male and female genitalia, venation, and lateral view of the head are given in Clarke (1941, Proc. U. S. Natl. Mus., 90: 33-286).

PLATES

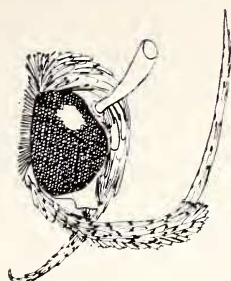
EXPLANATION OF THE FIGURES

Figures 1-10. Lateral view of heads of genera of Cosmopterigidae.

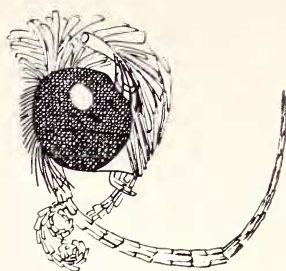
- Fig. 1. *Limnaecia* Stainton (*Limnaecia phragmitella* Stainton).
- Fig. 2. *Eteobalea*, gen. nov. (*Eteobalea sexnotella* Chambers).
- Fig. 3. *Eralea*, gen. nov. (*Eralea albalineella* Chambers).
- Fig. 4. *Anoncia* Clarke (*Anoncia conia* Walsingham).
- Fig. 5. *Sathrobrotia*, gen. nov. (*Sathrobrotia rileyi* Walsingham).
- Fig. 6. *Triclonella* Busek (*Triclonella pergandeella* Busek).
- Fig. 7. *Cosmopterix* Huebner (*Cosmopterix zieglerella* Huebner).
- Fig. 8. *Melanocinclis*, gen. nov. (*Melanocinclis lineigera*, sp. nov.).
- Fig. 9. *Teladoma* Busek (*Teladoma helianthi* Busek).
- Fig. 10. *Tanygona* Braun (*Tanygona lignicolorella* Braun).



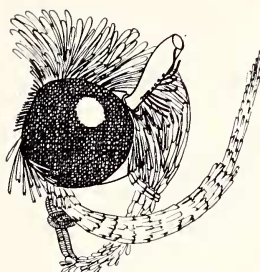
1. LIMNAECIA



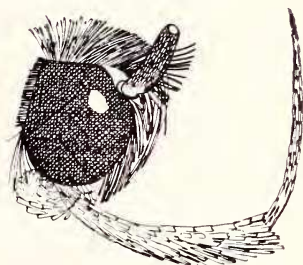
2. ETEOBALEA



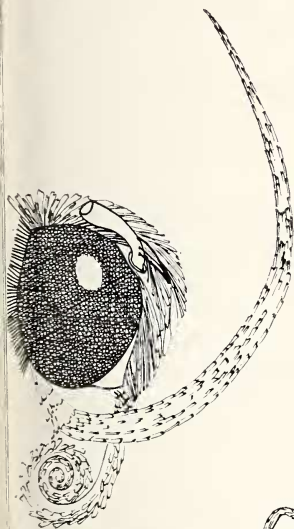
3. ERALEA



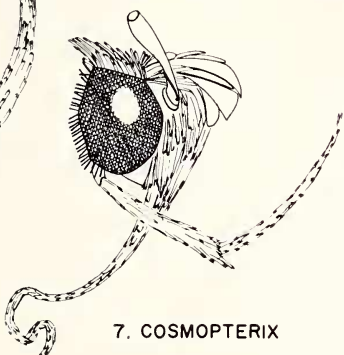
4. ANONCIA



5. SATHROBROTA



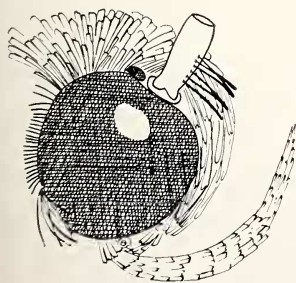
6. TRICLONELLA



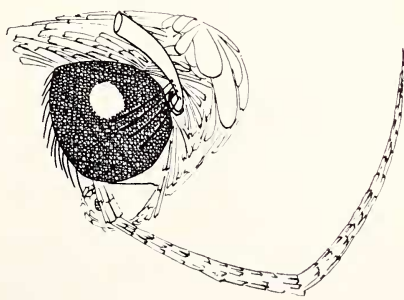
7. COSMOPTERYX



8. MELANOCINCLIS



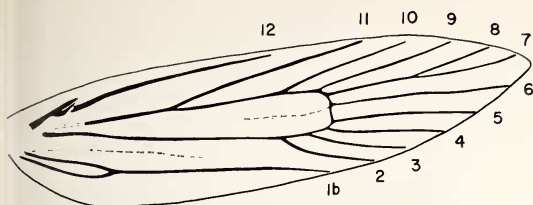
9. TELADOMA



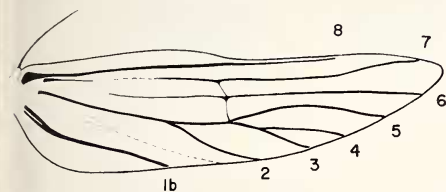
10. TANYGONA

Figures 11-20. Venation of genera of Cosmopterigidae.

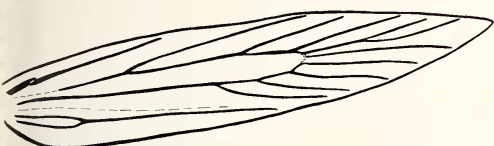
- Fig. 11. *Triclonella* Busck.
- Fig. 12. *Limnaecia* Stainton.
- Fig. 13. *Sathrobrotia*, *gen. nov.*
- Fig. 14. *Teladoma* Busck.
- Fig. 15. *Melanocinclis*, *gen. nov.*
- Fig. 16. *Tanygona* Braun.
- Fig. 17. *Cosmopterix* Huebner.
- Fig. 18. *Eralea*, *gen. nov.*
- Fig. 19. *Anoncia* Clarke.
- Fig. 20. *Eteobalea*, *gen. nov.*



II. TRICLONELLA



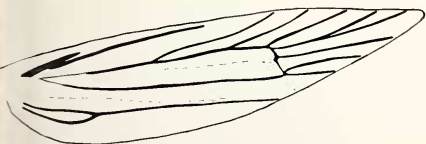
12. LIMNAECIA



13. SATHROBROTA



14. TELADOMA



20. ETEOBALEA



19. ANONCIA



18. ERALEA



17. COSMOPTERIX



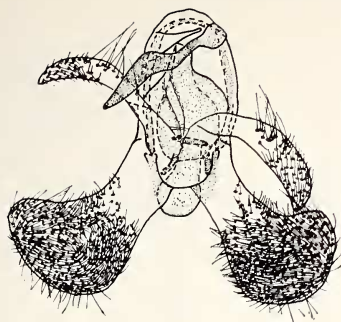
16. TANYGONA



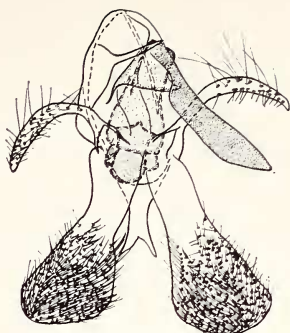
15. MELANOCINCLIS

Figures 21-28. Ventral view of male genitalia of species of
Cosmopterix.

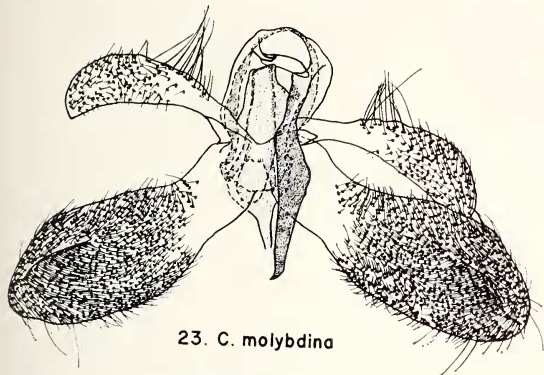
- Fig. 21. *Cosmopterix zieglerella* Huebner.
- Fig. 22. *C. nitens* Walsingham.
- Fig. 23. *C. molybdina*, *sp. nov.*
- Fig. 24. *C. pulchrimella* Chambers.
- Fig. 25. *C. bendidia*, *sp. nov.*
- Fig. 26. *C. attenuatella* Walker.
- Fig. 27. *C. montisella* Chambers.
- Fig. 28. *C. clandestinella* Busck.



21. *C. zieglerella*



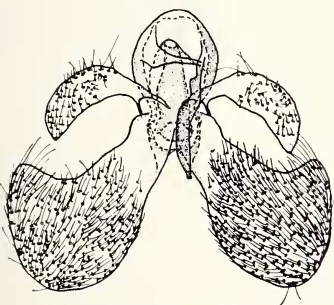
22. *C. nitens*



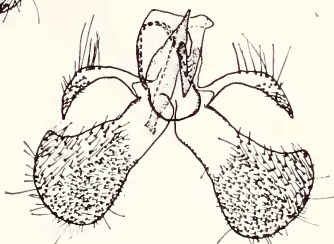
23. *C. molybdina*



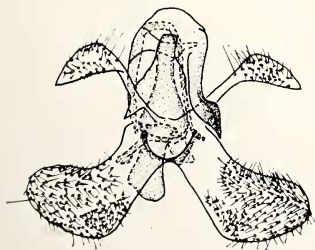
24. *C. pulchrimella*



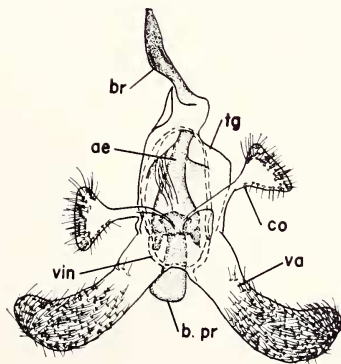
25. *C. bendidia*



26. *C. attenuatella*



27. *C. montisella*



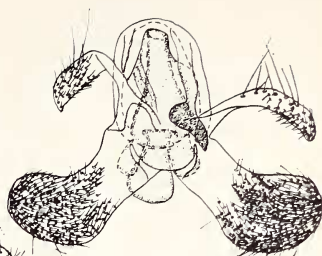
28. *C. clandestinella*

Figures 29-38. Ventral view of male genitalia of species of *Cosmopterix*.

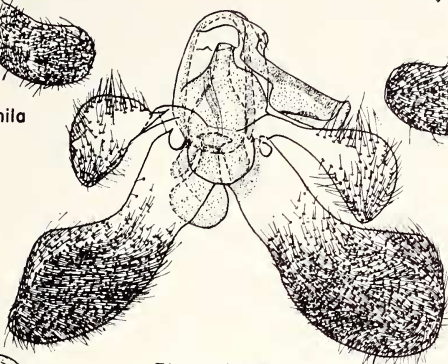
- Fig. 29. *Cosmopterix magophila* Meyrick.
- Fig. 30. *C. gracilens*, *sp. nov.*
- Fig. 31. *C. minutella* Beutenmueller.
- Fig. 32. *C. dapifera*, *sp. nov.*
- Fig. 33. *C. delicatella* Walsingham.
- Fig. 34. *C. dicacula*, *sp. nov.*
- Fig. 35. *C. lespedezae* Walsingham.
- Fig. 36. *C. abdita*, *sp. nov.*
- Fig. 37. *C. opulenta* Braun.
- Fig. 38. *C. quadrilineella* Chambers.



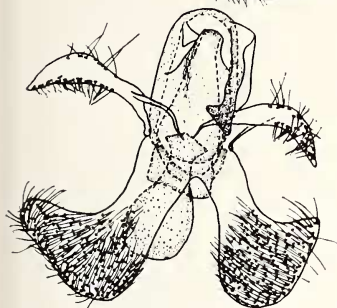
29. *C. magophila*



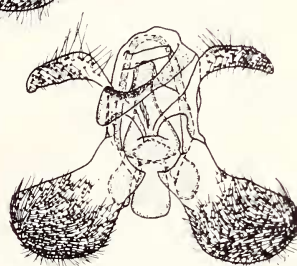
30. *C. gracilens*



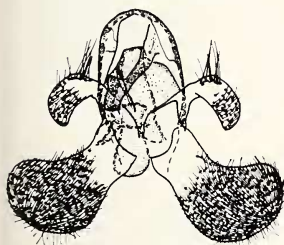
31. *C. minutella*



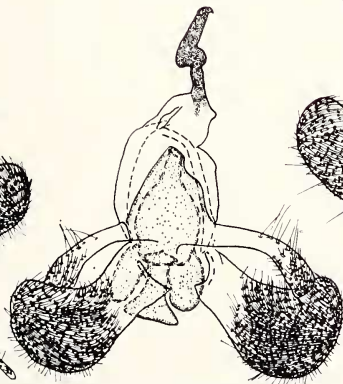
32. *C. dapifera*



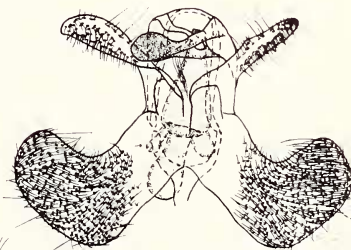
33. *C. delicatella*



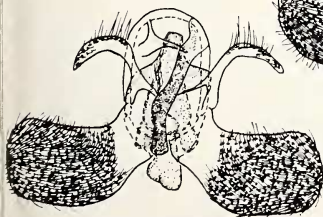
34. *C. dicacula*



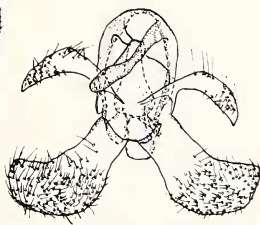
36. *C. abdita*



35. *C. lespedezae*



37. *C. opulenta*



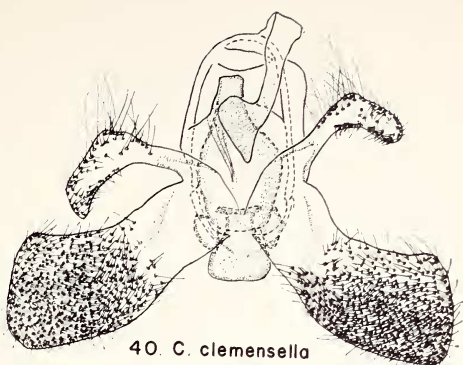
38. *C. quadrilineella*

Figures 39-44. Ventral view of male genitalia of species of
Cosmopterix.

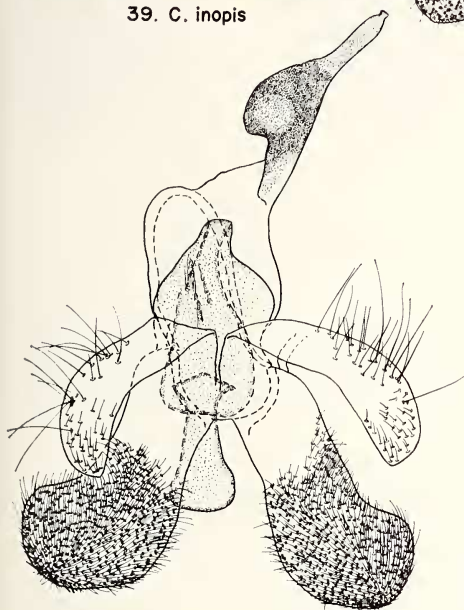
- Fig. 39. *Cosmopterix inopis*, sp. nov.
- Fig. 40. *C. clemensella* Stainton.
- Fig. 41. *C. gemmiferella* Clemens.
- Fig. 42. *C. bacata*, sp. nov.
- Fig. 43. *C. damnosa*, sp. nov.
- Fig. 44. *C. scirpicola*, sp. nov.



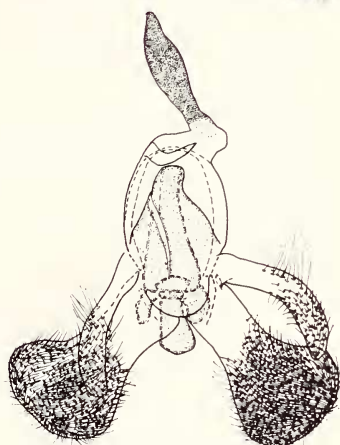
39. *C. inopis*



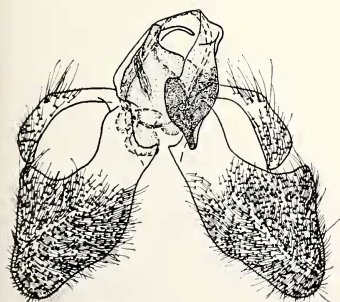
40. *C. clemensella*



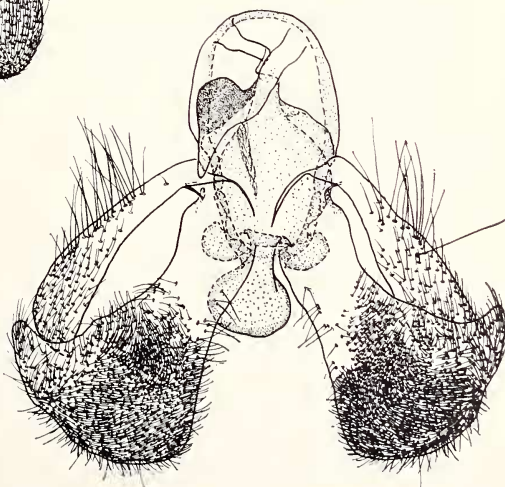
41. *C. gemmiferella*



42. *C. bacata*



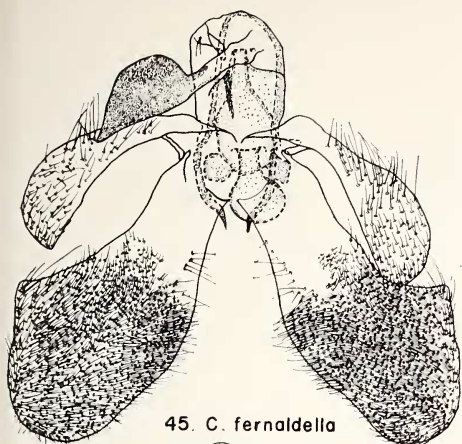
43. *C. damnosa*



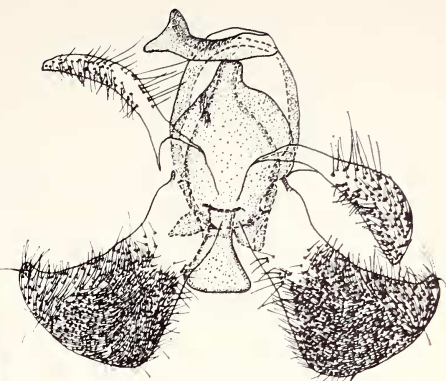
44. *C. scirpicola*

Figures 45-53. Ventral view of male genitalia of species of *Cosmopterix*, *Tanygona*, *Eralea*, and *Eteobalea*.

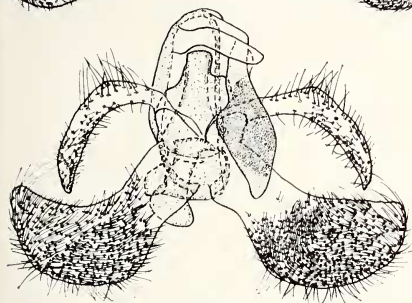
- Fig. 45. *Cosmopterix fernaldella* Walsingham.
- Fig. 46. *C. ebriola*, *sp. nov.*
- Fig. 47. *C. floridanella* Beutenmueller.
- Fig. 48. *Tanygona ipomoeae* Busck.
- Fig. 49. *T. lignicolorella* Braun.
- Fig. 50. *Eralea striata*, *sp. nov.*
- Fig. 51. *E. albalineella* Chambers.
- Fig. 52. *Eteobalea iridella* Busck.
- Fig. 53. *E. sexnotella* Chambers.



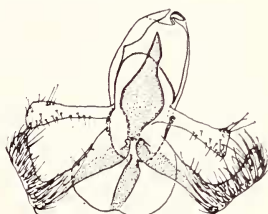
45. *C. fernaldella*



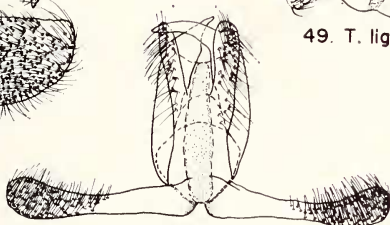
46. *C. ebriola*



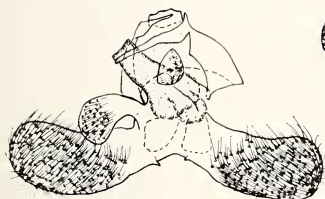
47. *C. floridanella*



49. *T. lignicolorella*



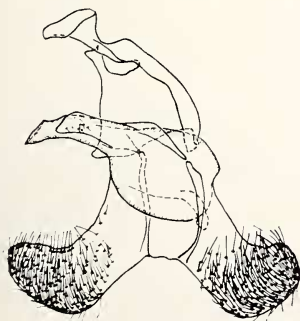
48. *T. ipomoeae*



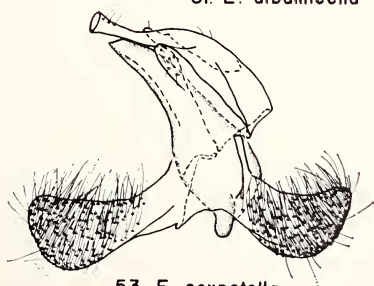
50. *E. striata*



51. *E. albalineella*



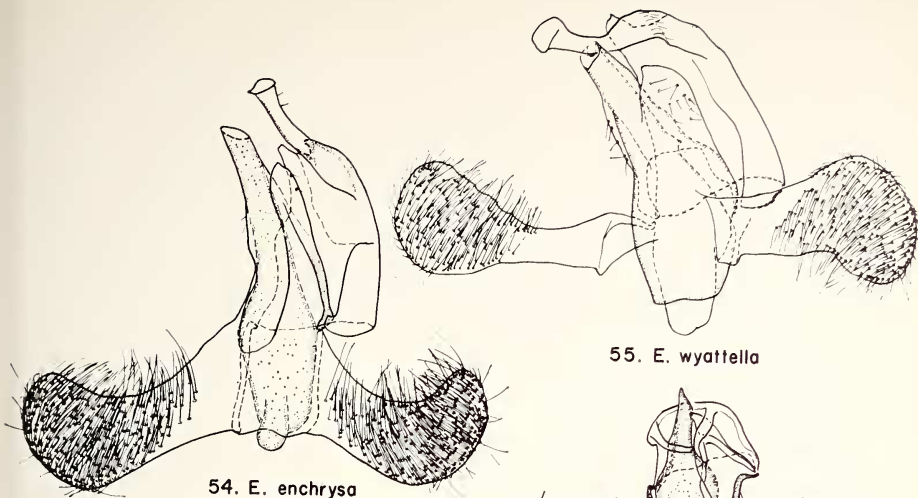
52. *E. iridella*



53. *E. sexnotella*

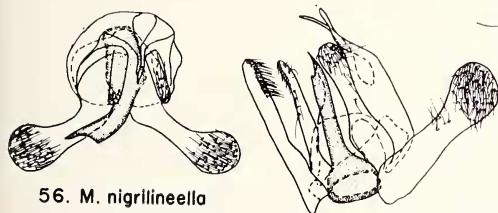
Figures 54-60. Ventral view of male genitalia of species of *Eteobalea*, *Melanocinclis*, *Stagmatophora*, and *Sathrobrot*.

- Fig. 54. *Eteobalea enchrysa*, sp. nov.
- Fig. 55. *E. wyattella* Barnes and Busck (left valva upside down).
- Fig. 56. *Melanocinclis nigrilineella* Chambers.
- Fig. 57. *M. lineigera*, sp. nov.
- Fig. 58. *Stagmatophora heydeniella* Fischer von Roeslerstamm.
- Fig. 59. *Sathrobrot* *rileyi* Walsingham.
- Fig. 60. *S. badia*, sp. nov.



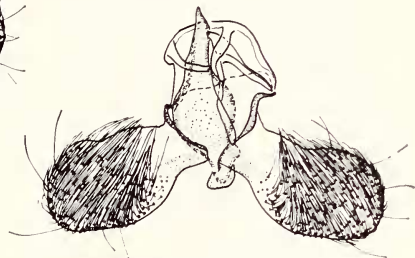
54. *E. enchrysa*

55. *E. wyattella*

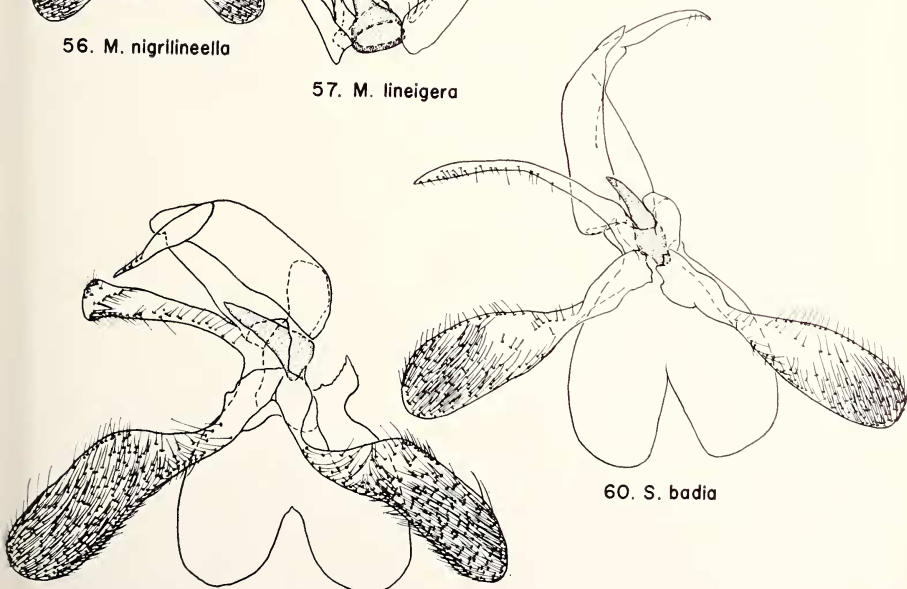


56. *M. nigrilineella*

57. *M. lineigera*



58. *S. heydeniella*



59. *S. rileyi*

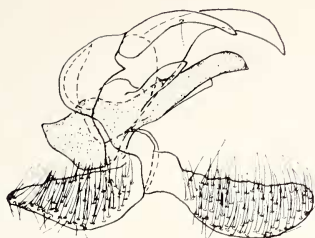
60. *S. badia*

Figures 61–66. Ventral view of male genitalia of species of *Teladoma*, *Pyroderces*, and *Limnaecia*.

- Fig. 61. *Teladoma helianthi* Busck.
- Fig. 62. *Pyroderces argyrogrammos* Zeller.
- Fig. 63. *Limnaecia phragmitella* Stainton.
- Fig. 64. *Teladoma incana*, sp. nov.
- Fig. 65. *T. astigmatica* Meyrick
- Fig. 66. *T. murina*, sp. nov.



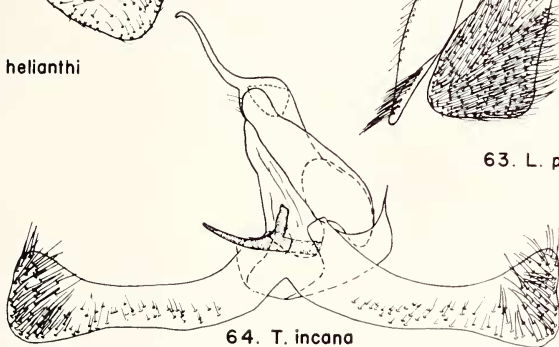
61. *T. helianthi*



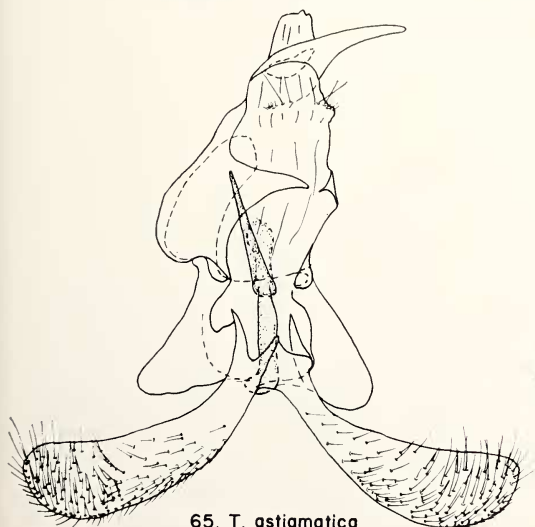
62. *P. argyrogrammos*



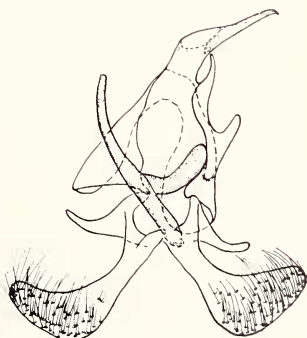
63. *L. phragmitella*



64. *T. incana*



65. *T. astigmatica*



66. *T. murina*

Figures 67-71. Ventral view of male genitalia of species of *Triclonella*.

Fig. 67. *Triclonella pergandeella* Busck.

Fig. 68. *T. xuthocelis*, sp. nov.

Fig. 68a. *T. xuthocelis*, sp. nov., aedeagus.

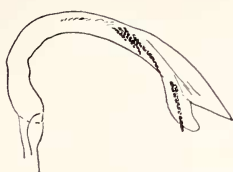
Fig. 69. *T. antidectis* Meyrick.

Fig. 70. *T. determinatella* Zeller.

Fig. 71. *T. bicoloripennis*, sp. nov.



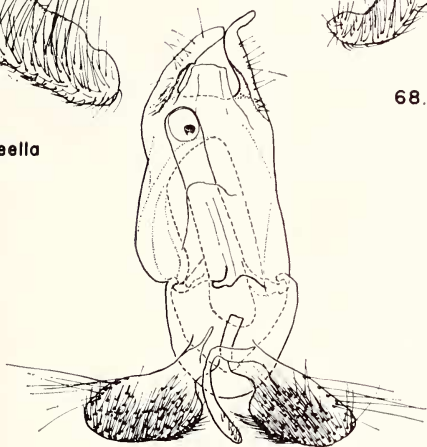
67. *T. pergandeella*



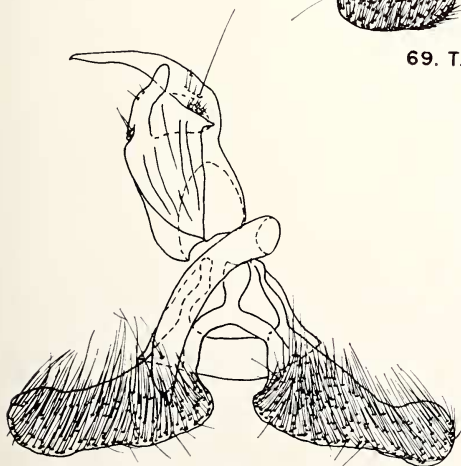
68a.



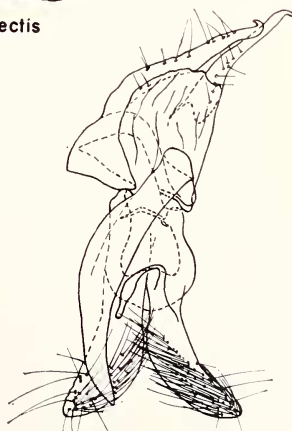
68. *T. xuthocelis*



69. *T. antidectis*



70. *T. determinatella*



71. *T. bicoloripennis*

Figures 72-75. Ventral view of male genitalia of species of *Anoncia*.

Fig. 72. *Anoncia conia* Walsingham.

Fig. 73. *A. sphacelina* Keifer.

Fig. 74. *A. glacialis*, *sp. nov.*

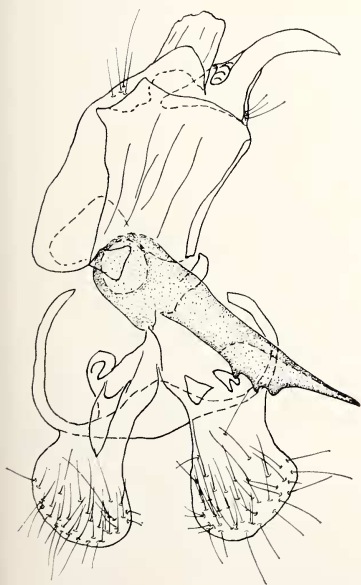
Fig. 75. *A. brunneipes*, *sp. nov.*



72. *A. conia*



73. *A. sphacelina*



74. *A. glacialis*



75. *A. brunneipes*

Figures 76–79. Ventral view of male genitalia of species of *Anoncia*.

Fig. 76. *Anoncia alboligula*, *sp. nov.*

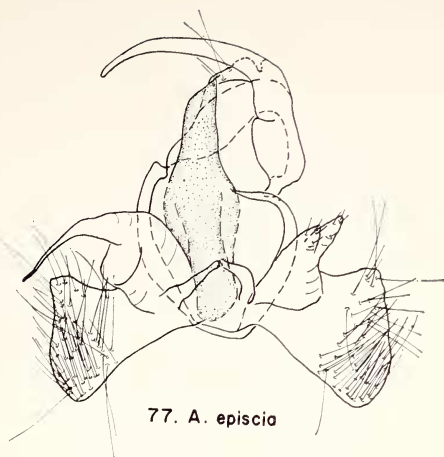
Fig. 77. *A. episcia* Walsingham.

Fig. 78. *A. piperata*, *sp. nov.*

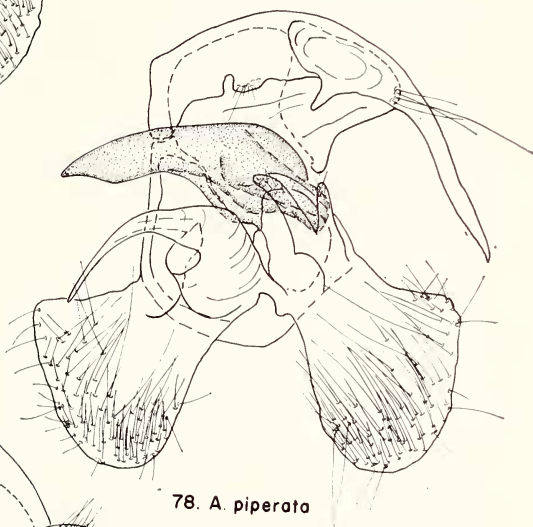
Fig. 79. *A. longa* Meyrick.



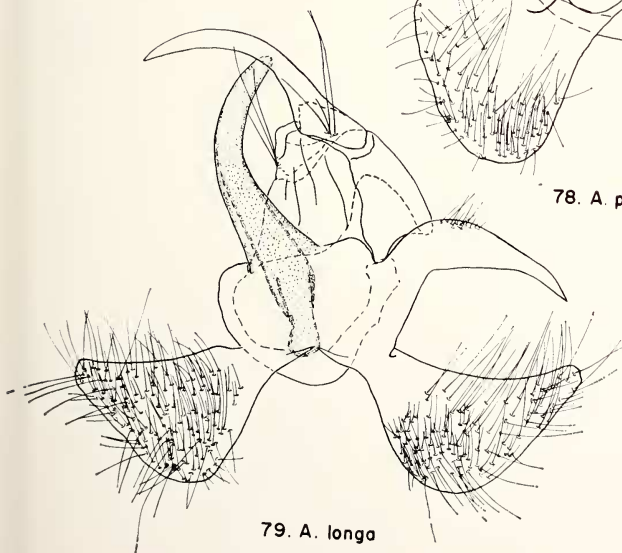
76. *A. alboligula*



77. *A. episcia*



78. *A. piperata*



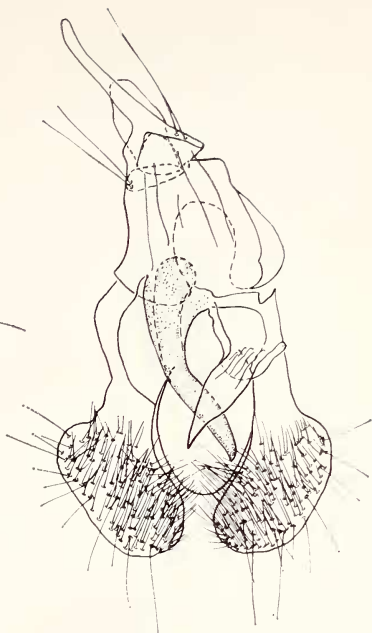
79. *A. longa*

Figures 80-84. Ventral view of male genitalia of species of *Anoncia*.

- Fig. 80. *Anoncia furvicosta*, *sp. nov.*
- Fig. 81. *A. nebritis*, *sp. nov.*
- Fig. 82. *A. fasciata* Walsingham.
- Fig. 83. *A. diveni* Heinrich.
- Fig. 84. *A. callida*, *sp. nov.*



80. *A. furvicosta*



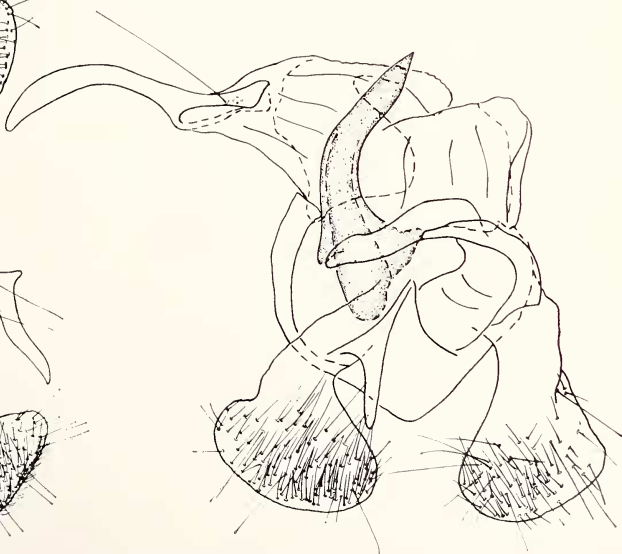
81. *A. nebritis*



82. *A. fasciata*



83. *A. diveni*

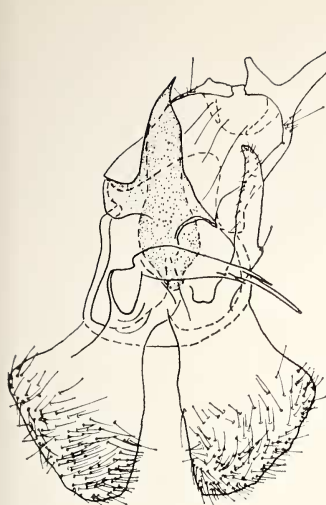


84. *A. callida*

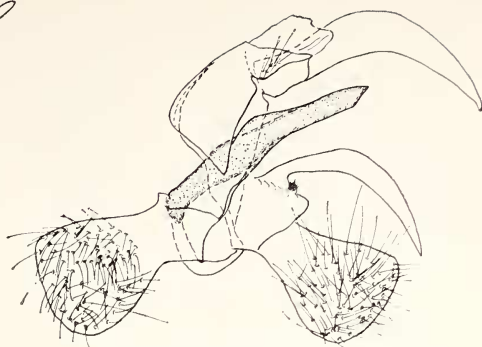
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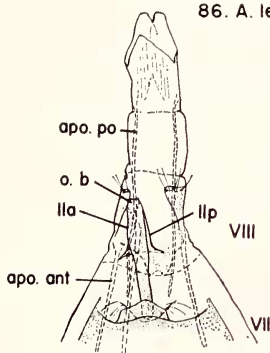
- Fig. 85. *Anoncia porriginosa*, sp. nov.
- Fig. 86. *A. leucoritis* Meyrick.
- Fig. 87. *Cosmopterix zieglerella* Huebner.
- Fig. 88. *C. nitens* Walsingham.
- Fig. 89. *C. molybdina*, sp. nov.
- Fig. 90. *C. attenuatella* Walker.
- Fig. 91. *C. dapifera*, sp. nov.



85. *A. porriginosa*



86. *A. leucoritis*

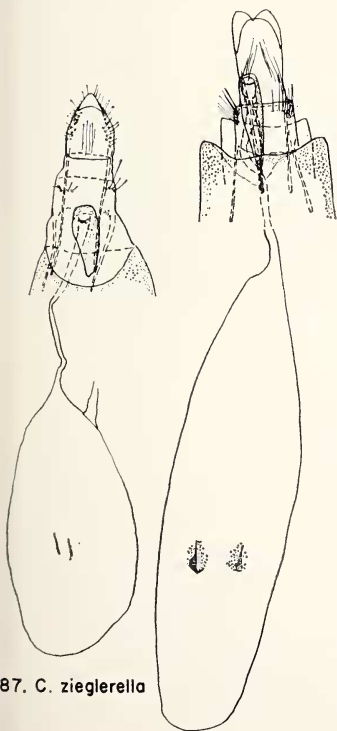


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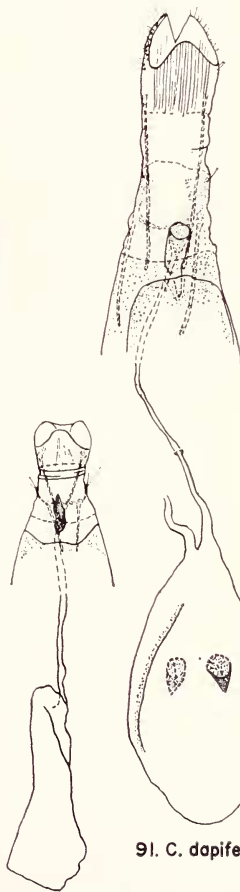


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88. *C. nitens*



89. *C. molybdina*

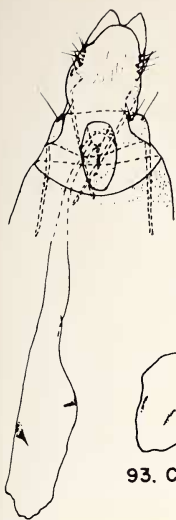


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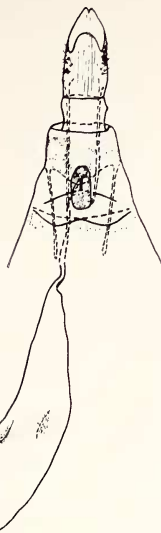
- Fig. 92. *Cosmopterix pulchrimella* Chambers.
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- Fig. 94. *C. quadrilincella* Chambers.
- Fig. 95. *C. clandestinella* Busck.
- Fig. 96. *C. lespedezae* Walsingham.
- Fig. 97. *C. fernaldella* Walsingham.
- Fig. 98. *C. fernaldella* Walsingham.
- Fig. 99. *C. clemensella* Stainton.
- Fig. 100. *C. ebriola*, *sp. nov.*



92. *C. pulchrimella*



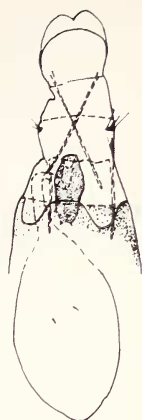
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94. *C. quadrilineella*



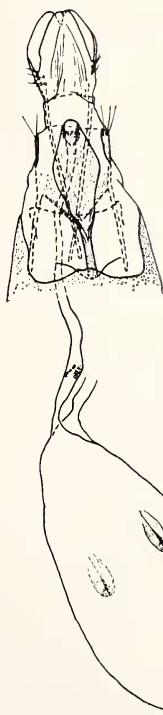
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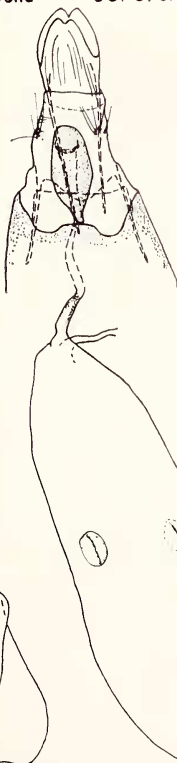
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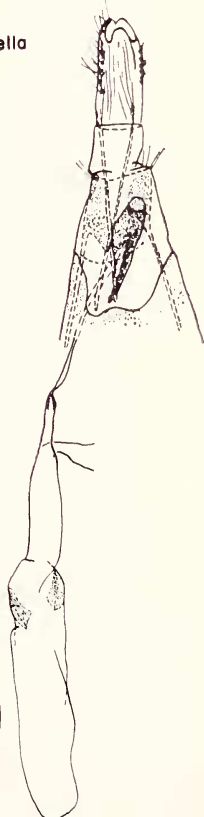
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98. *C. fernaldella*



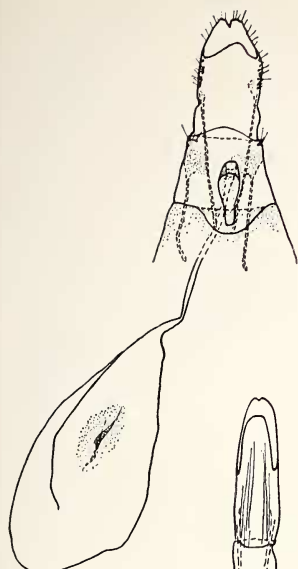
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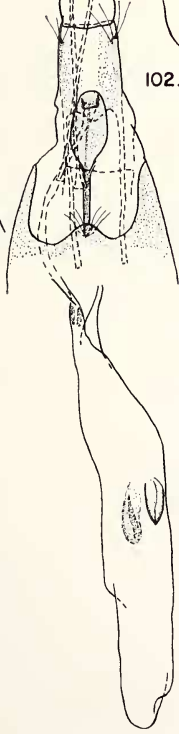
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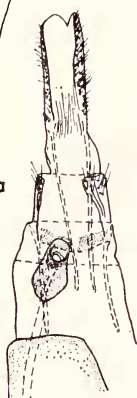
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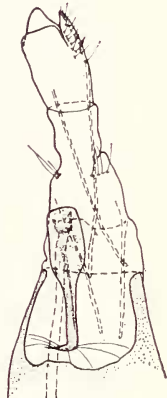
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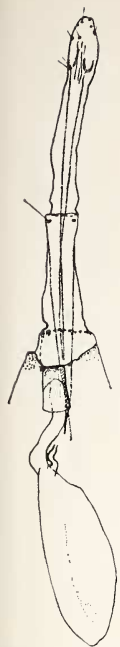
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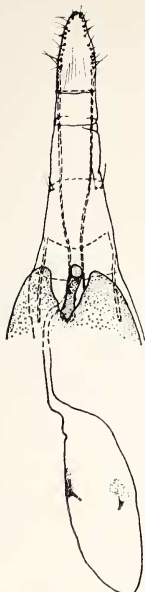
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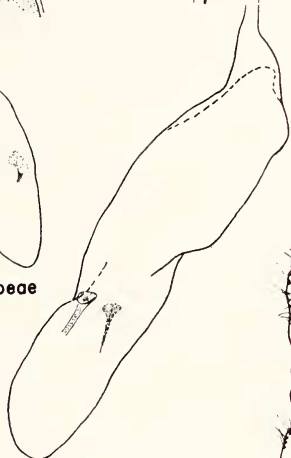
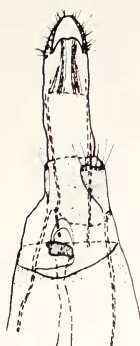
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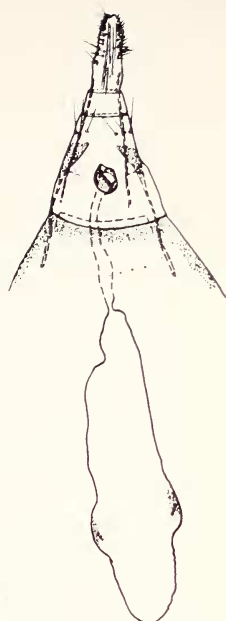
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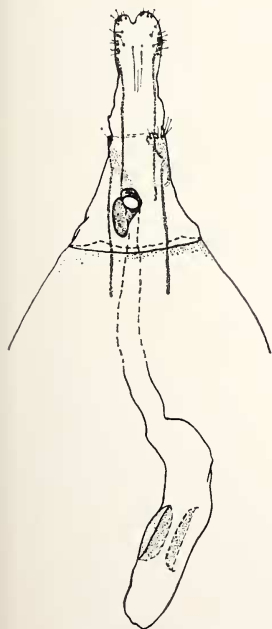
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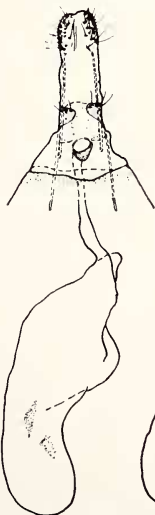
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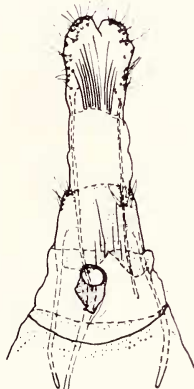
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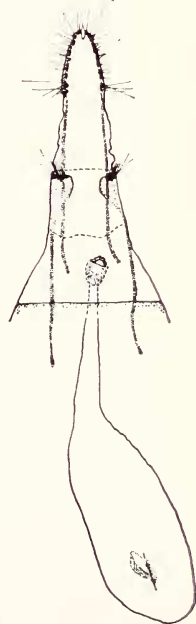
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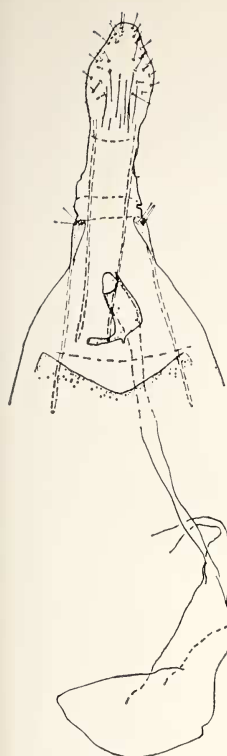
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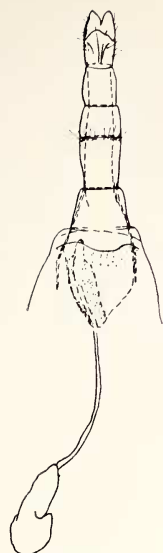
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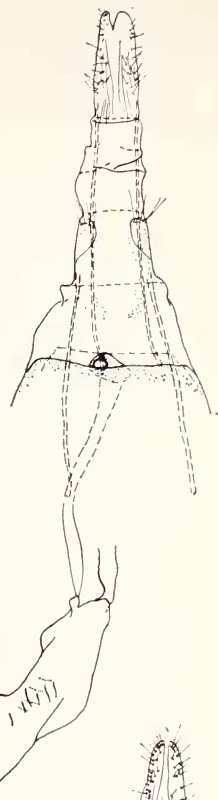
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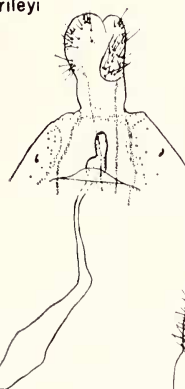
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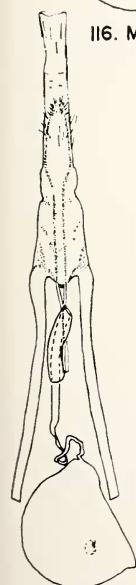
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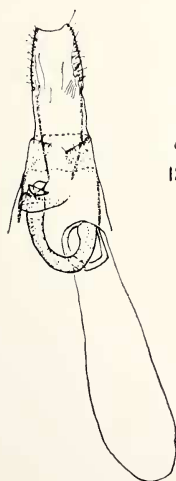
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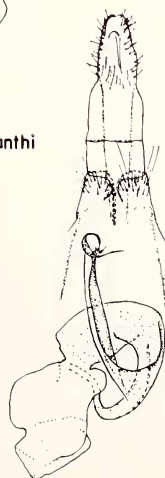
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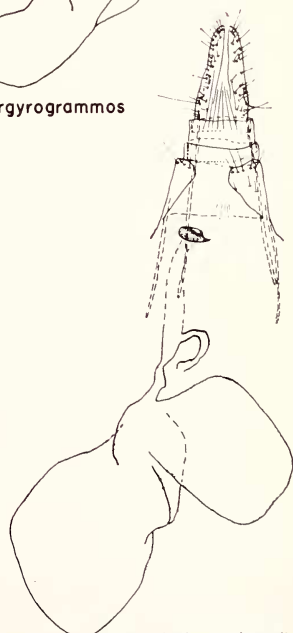
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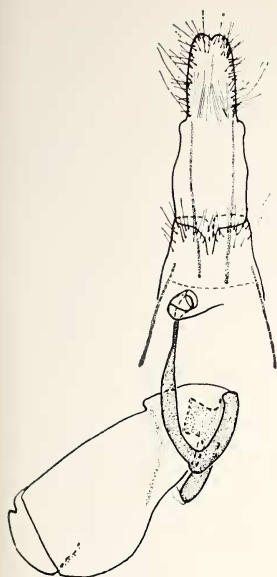
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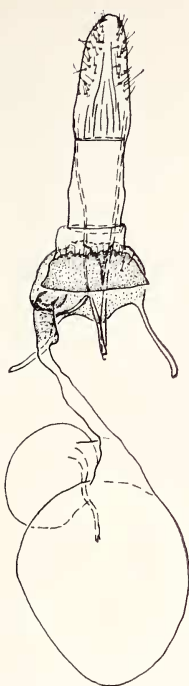
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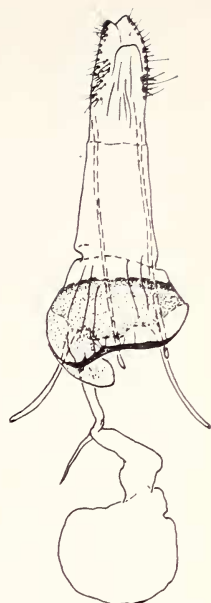
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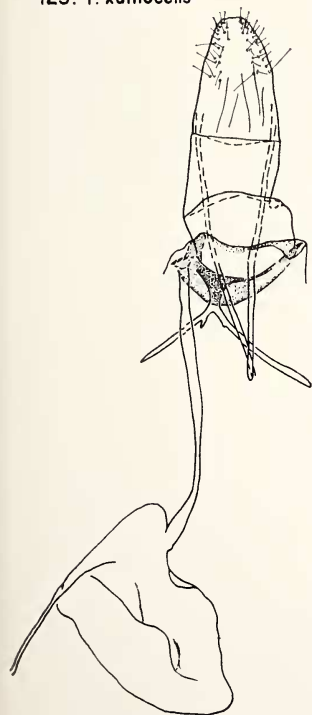
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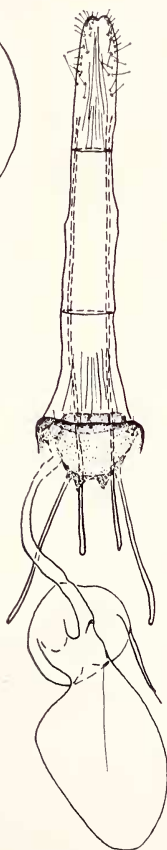
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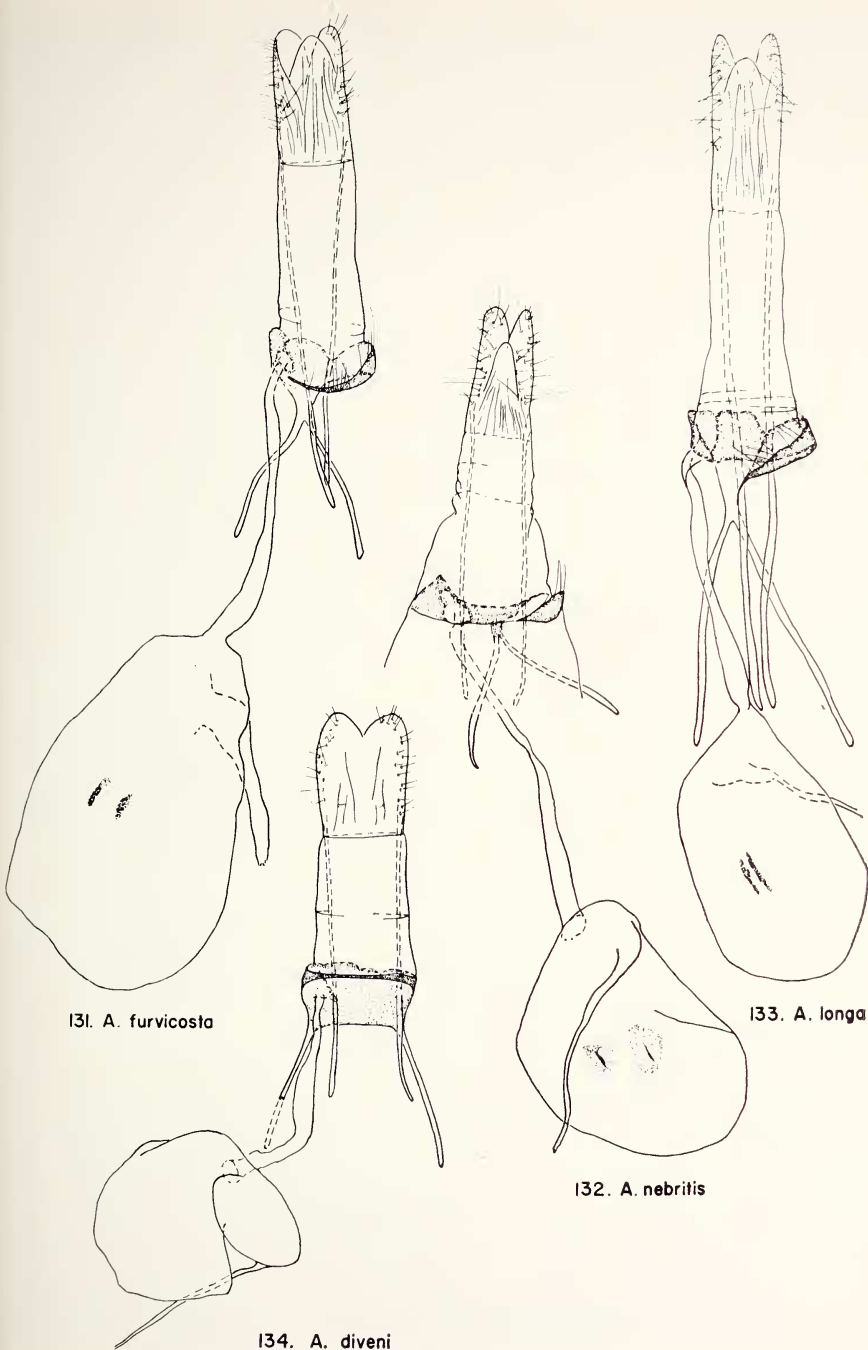
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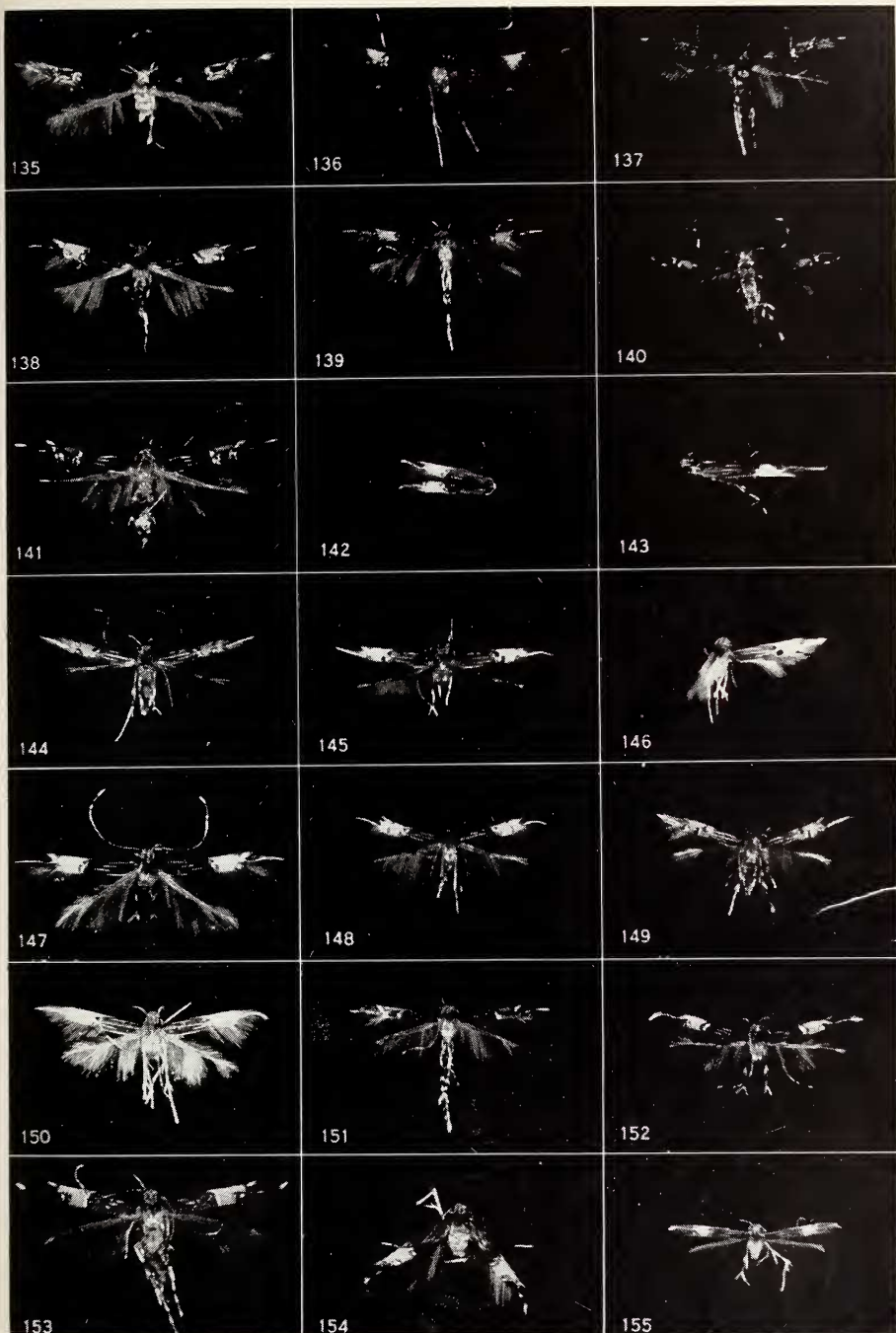
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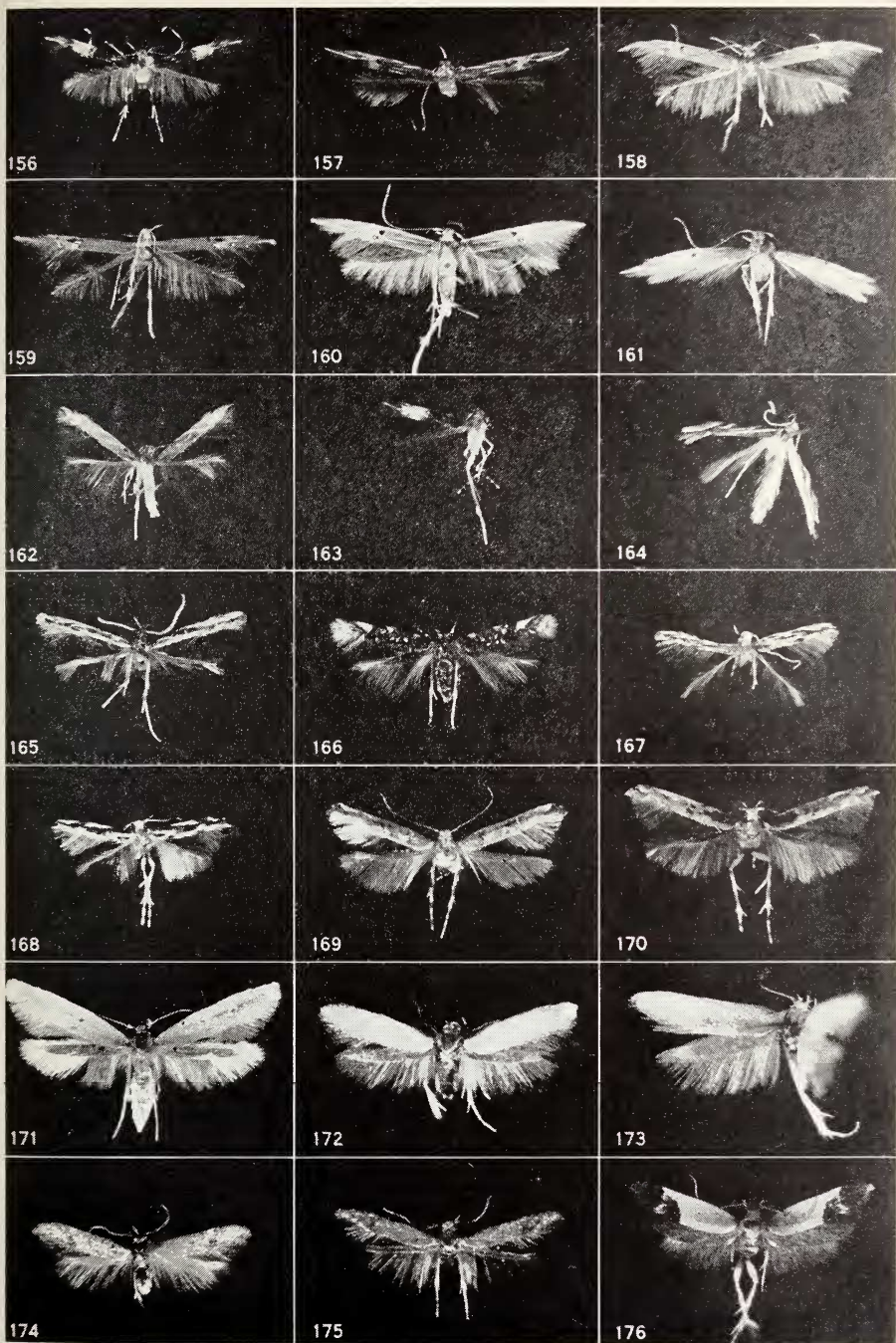
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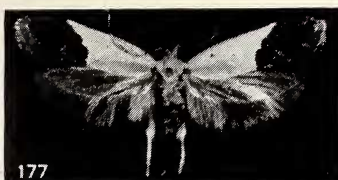
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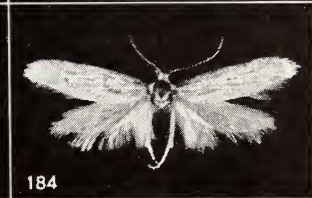
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